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# COLOUR INDEX

Third Edition

Volume 1

THE SOCIETY OF DYERS AND COLOURISTS

AMERICAN ASSOCIATION OF TEXTILE  
CHEMISTS AND COLORISTS















# COLOUR INDEX

THIRD EDITION

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IN FIVE VOLUMES

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Published by  
THE SOCIETY OF DYERS AND COLOURISTS  
*with acknowledgement to the*  
AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS  
*for its contribution of technical information*

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# Foreword

The *Colour Index* has long been established as the leading work in the field of colorant classification and is the most valuable reference publication for manufacturers and users of colorants. It is officially recognised by Departments of many Governments, for both scientific and commercial purposes. Its increasing use in these, and in other fields, and the extensive developments in the chemistry and application of colorants which have taken place in recent years, resulted in a demand for the previous edition which led to its going out of print much earlier than was originally expected.

The need for a completely revised and enlarged Third Edition was made evident by the increase in the number of generic names of individual dyes and pigments, from 6047 in the Second Edition and Supplement to 7898 in the Third Edition, an increase of more than 30% in 7 years. This increase is particularly marked in the reactive dyes section, where the number of C.I. Generic Names has risen from 88 to 361. There have also been large increases in the basic, disperse, fluorescent brightener and pigment sections. In addition there has been a marked tendency for alternative names to be given to existing dyes, to indicate their suitability for use on one or more of the newer synthetic-polymer fibres and on other substrates, such as paper and leather, thereby increasing the size of the lists of commercial names.

Many names have been added to the list of colorant manufacturers. The collaboration of manufacturers is essential if the information given in the *Colour Index* is to be comprehensive, and we would like to record our appreciation of the co-operation which has been received from manufacturers from all parts of the world.

The large increase in the volume of new material, combined with the necessity for a complete revision of the technical data contained in the Second Edition and its Supplement, has involved the members of the Society's Colour Index Editorial Board and of the Association's Colour Index Editorial Committee in much detailed and painstaking voluntary work over several years.

As Presidents of the Society of Dyers and Colourists and of the American Association of Textile Chemists and Colorists, it is our very pleasant task to record our sincere thanks to the Editorial Board and Editorial Committee and to all who have assisted in producing this edition of the *Colour Index*. We are confident that this work will prove invaluable to all who require information on the classification, manufacture or use of colorants.

WILLIAM G. B. GRANT

*President, The Society of Dyers and Colourists*

EDWIN I. STEARNS

*President, American Association of Textile Chemists and Colorists*

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The Editorial Board records its deep thanks to

The Oil and Colour Chemists' Association for help in the compilation of the Solvent Dye and Pigment sections.

Mr T. Green (*Ciba-Geigy (UK) Ltd*) for help in many directions but especially in the compilation of the Leather and Vat Dye sections.

Dr H. E. Nursten (*Procter Department of Food and Leather Science, University of Leeds*) for help in the compilation of the Food, Leather and Natural Dye sections.



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The Colour Index Editorial Committee expresses its deep appreciation to C. W. Maynard, Jr. (*E. I. du Pont de Nemours & Company, Inc.*) for reviewing the Chemical Constitutions contained in Volume 4. The committee also wishes to acknowledge the contributions of the American Dye Manufacturers Institute and the Dry Color Manufacturers Association in preparing the Third Edition.

\*Deceased 1970

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# INTRODUCTION

The *Second Edition* of the *Colour Index* has served the scientific, commercial and academic world well over the last 15 years, during which it has become recognised internationally as the authority in its particular field. A *Supplement* was published half way through this period, in 1963, and ever since then work has continued on the preparation of quarterly lists of *Additions & Amendments*, in collecting and collating technical information about new additions to the lists of C.I. Generic Names, and finally on planning and then compiling the *Third Edition*.

The dual classification adopted in the *Second Edition* whereby colorants are grouped according to recognised usage classes and also according to chemical constitution (where this has been made public) has proved satisfactory and is retained in the *Third Edition*. In most cases the C.I. Generic Names and C.I. Constitution Numbers assigned in the *Second Edition* remain unaltered, and changes have been made only when required by new information.

On the other hand, the great activity in the dye- and pigment-making industry, not only in producing completely new colorants—the *Third Edition* contains approximately 7900 C.I. Generic Names compared with 6047 in the *Second Edition* and its *Supplement*—but also in the constant additions to or replacements of makers' ranges and in the renaming of or giving alternative names to old colorants or ranges, has raised many difficult problems and the Society has received many suggestions for solving them. It was finally decided that the difficulties that had arisen could best be overcome by presenting only technical information under the heading of each C.I. Generic Name (Volumes 1–3), transferring the lists of commercial colorants formerly there to a separate volume (Volume 5), and arranging them alphabetically under their C.I. Generic Names. The Commercial Names Index in which individual colorants are listed alphabetically is also placed in that volume. The great advantage of this system is that it allows these two indexes to be revised and re-issued at suitable intervals without the need to reproduce the technical matter in Volumes 1–4, where changes are likely to be less extensive. Removal of the commercial names also enabled the technical information to be given in tabular form.

As a result of these changes the *Third Edition* consists of five volumes. Volumes 1–3 contain in tabular form the technical information for each C.I. Generic Name and Volume 4 gives structural formulae, where known, together with an outline of the method of preparation and literature references.

The entries in Volumes 1–3 and Volume 4 are cross-referenced. Volume 5 contains lists of manufacturers and the code letters allocated to them, the C.I. Generic Names Index and the Commercial Names Index. The latter continues to contain all obsolete range names and the range names used by merchants, but it no longer contains the names of all homogeneous colorants made by the former IG.

Each volume has four-figure page numbers, the first digit in each number indicating the volume in which the page is to be found.

In compiling the *Third Edition* judicious assessment and balancing has had to be made of the claims made by firms manufacturing the same product. It must be explicitly stated that neither the Society, nor the Association, nor any of the dye and pigment makers can guarantee that the results obtained by any user will be strictly in accord with the data given in this *Index*. It is, indeed, a well-established custom in the dye and pigment making and using industries that all such statements are 'without guarantee', for while a maker may guarantee the quality of his products he cannot guarantee that someone else has used them correctly. Nevertheless the greatest care has been taken in the presentation of the data given in this *Index* and all the proofs have been carefully checked and reviewed by the Society's Colour Index Editorial Board and the Association's Colour Index Editorial Committee.

In the preparation of the *Third Edition* the Society's Colour Index Editorial Board has received the fullest co-operation of the Association's Colour Index Editorial Committee and, with few exceptions, of the world's dye and pigment makers. In addition, help has been given by various organisations and individuals. It is impossible to mention all by name except where the help has been outstanding; in such cases special mention is made under the lists giving the composition of the Editorial Board and the Editorial Committee. The Board also gratefully acknowledges the part played by the Society's Staff, and in particular Mr. D. W. McLean, B.Sc. (Technical Officer—Colour Index), in the preparation of these volumes.

The Society and the Association pay tribute to the public spirit of all who have voluntarily assisted in the preparation of the *Third Edition*, the Society having being particularly fortunate in that, apart from two early changes, the membership of the Colour Index Editorial Board has remained constant throughout the long years of preparation of the *Third Edition*.

## ADDITIONS AND AMENDMENTS

The greatest care has been taken to ensure that the *Third Edition* of the *Colour Index* is free from error but it is inevitable that some mistakes will have escaped editorial notice. It is earnestly hoped that anyone noticing a mistake of any kind in the *Colour Index* will immediately draw this to the attention of the Society's Colour Index Editorial Board or the Association's Colour Index Editorial Committee as appropriate. Corrections of such errors will be published as speedily as possible in *Additions & Amendments* to the *Third Edition* of the *Colour Index*.

It is well known that a reference work of this nature can never be final and additions and amendments become necessary from the moment that the manuscript goes to the printer. The Society and the Association recognise that it is their duty to keep the *Colour Index* as up to date as possible and therefore not only will *Additions & Amendments* be issued quarterly but Volume 5 (which contains the Commercial Names indexed alphabetically and under their C.I. Generic Names) will be brought up to date and issued in revised form at suitable intervals. For this to be done successfully it will be necessary to have the continued co-operation of the dye and pigment manufacturers, who are asked to keep the Society and the Association informed about changes made in, or additions to, their ranges of products. Such information should be provided at the time the changes or additions are made, so as to simplify the work of compiling the matter for *Additions & Amendments*.

It is also hoped that those dye and pigment makers who have hitherto not been in a position to supply information on their products will, as soon as possible, send in lists of products together with the necessary information on their properties and to constitution or equivalents. Where a dye or pigment is claimed to be unique but its constitution cannot be disclosed, the maker must submit a statement that according to his knowledge and belief no known equivalent is made by another maker. Newcomers in the field of dye and pigment making are similarly asked to keep the Society or the Association regularly informed of their range of products so that the necessary information can appear in *Additions & Amendments*.

# COLOUR INDEX

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VOLUME

1

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*by*

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## PREAMBLE TO VOLUMES 1-3

THESE three volumes contain in tabular form the more important properties, from the usage point of view, of the colorants listed by C.I. Generic Name in alphabetical order of their usage groups. Both the active and the now obsolete C.I. Generic Names are included, data relating to the latter being given in case the manufacture of a colorant formerly listed under one of them is recommenced by the previous maker or started up by another. Exceptions in which no data are given have arisen because the colorants formerly listed under the C.I. Generic Name concerned went out of manufacture before the necessary information had been received from the makers or because colorants had been mistakenly said to be without equivalents when in fact they were identical with colorants already covered by C.I. Generic Names.

Some colorants are of importance in more than one usage class, e.g. some vat dyes are important both as textile dyes and as pigments, and in such cases they appear under more than one C.I. Generic Name.

### Hue Description

The most important property of any colorant is its hue on a given substrate. The colorants in each usage section have therefore been subdivided into the hue groups conventionally used in dyeing literature, viz. yellow, orange, red, violet, blue, green, brown and black in that order, with the addition of white and metals to the pigment section.

The commercial name under which a colorant is marketed does not necessarily give a precise indication of its hue. This is well illustrated by the wide divergence which frequently occurs between the commercial names used by different manufacturers for the same colorant. To overcome these inconsistencies and to introduce some measure of standardisation a *Hue Indication Chart* forms part of the *Colour Index*. This chart, in the shape of a hexagon, gives prominence to the six major divisions of alternate primary and secondary hues and at the same time provides continuity. Each division of the hexagon is divided into three parts, e.g. the yellow is divided into greenish yellow, yellow and reddish yellow. The tertiary hues are situated inside the area of the primary and secondary hues and in association with the parent hues. Special provision is made for the pinks, which are placed

adjacent to the reds but outside the hexagon. With each chart there is an outline diagram which bears the formal descriptions associated with the individual chromatic areas, each of which is designated by an outline which functions as a line of demarcation between the different areas. Many of the chromatic areas are qualified by the terms bright or dull. The hues given in this *Index* have all been determined by use of this *Chart*.

### Technical Information

Each usage section has necessarily had to have individual treatment but in most sections the information given consists mainly of data relating to

- (a) Application properties and methods
- (b) Fastness properties and other properties such as effect of metals
- (c) In the case of a colorant having mainly a textile usage indication of any non-textile usage it may have.

Fastness properties are in most cases given as ISO and/or AATCC ratings. The information, except in cases of a maker's speciality, has been collected from a wide variety of sources and adjustments have had to be made to get balance between the various statements. It cannot be emphasised too strongly that it follows of necessity that the ratings in the *Index* must be regarded not as being precise but only as guides.

Each usage section has a foreword describing the conventions used in presenting the information and data contained in it.

Where in the Non-textile usage section there appears 'See Leather Dyes section' this indicates that, as there is at present considerable commercial use on leather of the dyes listed under that C.I. Generic Name, information about their use on leather is to be found in the Leather Dyes section in Volume 2. Where mention of leather usage is made without reference to the Leather Dyes section, this is an indication that such usage is not of sufficient commercial importance to warrant the dye's inclusion in the Leather Dyes section.

A list, periodically revised, of text books and other literature dealing with the application of colorants to various substrates is included in the A.S.D.C. Study Guide, which is obtainable from the Society.





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# ACID DYES

The acid dyes were probably originally so named because of the presence in their molecules of one or more sulphonic acid or other acidic groups. The term applies to an application class rather than a chemical class, however, and since acidic groups are also present in many mordant, direct and reactive dyes their presence is not a distinguishing feature. Acid dyes are water-soluble anionic dyes that are applied to nitrogenous fibres such as wool, silk, nylon and modified acrylic fibres from acid or neutral baths. Attachment to the fibre is attributed at least partly to salt formation between anionic groups in the dyes and cationic groups in the fibre. Acid dyes are not substantive to cellulosic fibres.

Chemically the acid dyes consist of azo, anthraquinone, triphenylmethane, azine, xanthene, ketonimine, nitro and nitroso compounds. Azo dyes may be applied as pre-formed 1:1 or 1:2 metal complexes. A complete range of hues can be obtained, many of them being very bright, and the fastness properties vary from poor to very good.

When acid dyes are applied to wool the bonds between dye anions and amino groups in the fibre are easily broken and re-formed, and in consequence many of the dyes migrate in hot wet conditions. Ease of migration is an advantage in that it gives good levelling properties, but it also leads to poor fastness to wet treatments. Many acid dyes have excellent wet fastness properties on wool, however, and it appears probable that these are attached to the fibre by some means other than ionic bonds; since in general increase in molecular size results in better fastness and inferior levelling properties it is thought that attachment to the fibre then depends chiefly on non-polar van der Waals forces, the strength of which is proportional to the area of contact between dye and fibre. Acid dyes for wool are often subdivided roughly into Levelling (sometimes called Equalising) and Milling types, the latter having much better fastness to wet processing than the former. It is not possible to combine the advantages of good levelling and maximum fastness to milling in a single dye, but there are many general-purpose dyes with intermediate properties in both respects. In general the levelling dyes are applied from strongly acid baths and the milling dyes from weakly acid baths; 1:2 metal complexes of azo dyes are applied in nearly neutral conditions.

Wool is dyed in all forms, e.g., loose wool, slubbing, yarn, knitted and woven fabrics, felts and garments. Dyes with good migration properties find their chief use on yarns and fabrics, but dyes with inferior levelling properties and good fastness to wet processing can be used satisfactorily on loose wool and slubbing.

When applied on silk and nylon, acid dyes vary in properties in much the same way as on wool. Ranges of dyes for these applications have been selected by manufacturers largely from dyes originally produced chiefly for use on wool, but many products have been developed specially for nylon and other synthetic-polymer fibres.

Acid dyes are also applied by direct printing on protein fibres and nylon and by the Vigoureux process; selected dyes may be printed on viscose from a paste containing urea. Other important uses include the dyeing of leather, paper, jute, straw and anodised aluminium, the colouring of food

and drink, drugs, cosmetics, insecticides, fertilisers, wood stains, varnishes, inks, plastics and resins, and the manufacture of toners and pigments of the lake type.

## Arrangement of Information

In this section a concise indication of the chief application methods and properties of the acid dyes is given, but no attempt has been made to provide comprehensive information. Details relating to the older dyes have been derived from a large amount of information obtained from various sources. The evidence is sometimes conflicting, and it has then been necessary to select from it either by compromise or preference in accordance with the editor's judgment; occasionally when no reliable means of resolving a considerable difference is apparent it has been thought better to give none rather than possibly misleading information.

A necessary explanation of some features of the tables is now provided.

## Application Methods

The application methods quoted are those generally preferred, and usually no reference is made to the less commonly used variants.

## The Dyeing of Wool

The three main methods for application of acid dyes to wool are characterised by dyebath conditions as follows:

1. Nearly neutral (pH approx. 7.0-5.5)
2. Weakly acid (pH approx. 5.5-3.5)
3. Sulphuric acid (pH < 3.5)

These methods are quoted in the tables by the above numbers. Levelling properties are shown where possible in accordance with the SDC Migration Test described by the Committee on the Dyeing Properties of Wool Dyes [*JSDC*, 1950 (66) 213].

Details of the staining of fibres other than wool in union dyeing quoted in the tables refer to the effect obtained in dyeings by the preferred method. The following abbreviations are used:

- u* unstained
- vss* very slightly stained
- ss* slightly stained
- s* stained
- hs* heavily stained
- d* dyed

Since commercial dyes often contain impurities varying in nature and amount between the products of different makers the staining properties of dyes classed together under a given C.I. Generic Name may not be entirely uniform.

## Fastness Properties

Except where otherwise stated the fastness properties quoted in the tables relate to dyeings on wool. With few exceptions the ratings are restricted to those obtained by AATCC and ISO methods. It should be emphasised that the information has been collected from numerous sources over a considerable period, and its value for the purpose of comparing one dye with another is limited by this circumstance; the ratings



should be regarded as approximate. The properties covered by the tables are frequently fewer than those given for the same dye in the Second Edition, the value of additional information being considered insufficient to justify the space that it would occupy.

### Non-textile Usage

Under this heading general information is given relating to usage as dyes for food and drink, leather, paper, cosmetics and miscellaneous substrates, and also in the form of virtu-

ally insoluble salts applied as pigments. The major information on pigments and dyes for food and leather is given in the appropriate sections of the *Colour Index*, and cross-references are given to these where possible; when detailed information is lacking such usages are mentioned only in the tables of this section.

Some acid dyes are also mordant dyes, and a reference is then given to the C.I. Mordant Dyes section or the effect of application with a mordant is briefly described (see, for example, C.I. Acid Reds 14 and 66).

## LITERATURE

The literature relating to the application of acid dyes is voluminous and covers a long period; it is therefore impracticable to provide a complete bibliography.

Probably a systematic examination of the journals devoted to application of dyes would give the most complete cover, and among these the *Journal of the Society of Dyers and Colourists* goes back to 1884. The first mention of acid dyes is in February 1885, and a pattern sheet shows carpet yarn dyed with acid colours such as Naphthol Yellow, Orange R, Magenta, etc. [*JSDC*, 1884-5 (1) 96].

Many dyemakers issue comprehensive manuals on the dyeing of wool, silk and nylon, which contain much useful information.

Among textbooks the following list, although in no sense comprehensive, covers much of the ground.

Bird, C. L., *The Theory and Practice of Wool Dyeing*, 3rd Edn (The Society of Dyers and Colourists, Bradford, 1963)

Diserens, L., *Chemical Technology of Dyeing and Printing*, Vol. II, translated and revised from the 2nd German Edn by P. Wengraf and H. P. Baumann (Reinhold, New York, 1951)

Horsfall, R. S. and Lawrie, L. G., *The Dyeing of Textile Fibres*, 2nd Edn (Chapman & Hall, London, 1946, reprinted 1949)

Knecht, E. and Fothergill, J. B., *The Principles and Practice of Textile Printing*, 4th Edn. Edited with additional notes by J. G. Hurst (Griffin, London, 1952)

Knecht, E., Rawson, C. and Lowenthal, R., *Manual of Dyeing*, 9th Edn (Griffin, London, 1947)

Schmidlin, H. U., *Preparation and Dyeing of Synthetic Fibres*, translated by W. Meitner and A. F. Kertess from the German Edn (Chapman & Hall, London, 1963)

Trotman, E. R., *The Dyeing and Chemical Technology of Textile Fibres*, 4th Edn (Griffin, London, 1970)

Vickerstaff, T., *The Physical Chemistry of Dyeing*, 2nd Edn (Oliver & Boyd, London, 1954)

Wilcock, C. C. and Ashworth, J. L., *Whittaker's 'Dyeing with Coal-tar Dyestuffs'*, 6th Edn (Ballière, Tindall & Cox, London, 1964)

# C.I. Acid Yellow 1—2

C.I. Acid Yellow	1	2
CHEMICAL CLASS	Nitro	Quinoline
C.I. CONSTITUTION NUMBER	10316	47010
HUE Daylight Artificial light (tungsten)	Bright greenish yellow Slightly redder, brighter	Greenish yellow Redder
DYEING: WOOL Method	3	—
Levelling	Good; can be salted	—
S.D.C. migration test method/grade	I/4	—
Staining other fibres	—	Nylon— <i>d</i> , acetate— <i>hs</i> , cellulose— <i>ss</i>
DYEING: OTHER FIBRES	Nylon: formic acid (light dyeings only)	Orlon: cuprous ion method Exhaustion and levelling: good
PRINTING		Wool, silk and nylon
FASTNESS PROPERTIES Method	AATCC	ISO
Alkali	4	4
Carbonising	4-5	5
Chlorination — alteration	4	4-5
staining wool	4	5
Decatising	4-5	5
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	1	1
normal	1	1
2 × normal	1	1
Milling, alkaline — alteration	1-2	1
staining wool	1-2	1
Milling, acid — alteration	—	4
staining wool	—	1
Peroxide bleaching — alteration	1	1
staining wool	1	5
Perspiration	1	3
Potting — alteration	5	3-4
staining wool	5	1
Sea water — alteration	2	1
staining wool	2	1
Stoving	4-5	4
Washing — alteration	2	1
staining wool	2	5
OTHER PROPERTIES Dischargeability	Poor	
Effect of metals — copper	Somewhat duller	
chromium	—	
iron	Much duller	
NON-TEXTILE USAGE	Paper: Bright yellows in dip dyeing Pigments: heavy metal salts are used mainly for printing inks, also for rubber Furs, soap, drugs and cosmetics, biological stain and indicator See Leather Dyes section	Paper: beater dyeing, occasionally for surface colouring See Leather Dyes section
NOTES		*Hot pressing (wet)

# C.I. Acid Yellow 3—7

C.I. Acid Yellow	3	4
CHEMICAL CLASS	Quinoline	Monoazo
C.I. CONSTITUTION NUMBER	47005	18695
HUE Daylight Artificial light (tungsten)	Bright greenish yellow Little change	Reddish yellow —
DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres	3  Good; can be salted I/4 Acetate and cellulose—ss	3  Very good — —
DYEING: OTHER FIBRES	Nylon: formic acid Silk: sulphuric acid, levelling: good	Silk: soap bath broken with sulphuric acid
PRINTING	Wool and silk, direct and for illuminating discharges	
FASTNESS PROPERTIES Method	AATCC	ISO
Alkali	3	3-4
Carbonising	5	5
Chlorination — alteration	1	4
staining wool	—	3
Decatising	5	4-5
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal	2	1
normal	3	2
2 × normal	4	3
Milling, alkaline — alteration	2	1
staining wool	2	2
Milling, acid — alteration	—	4
staining wool	—	1
Peroxide bleaching — alteration	1	1
staining wool	1	5
Perspiration	1	3-4
Potting — alteration	—	3
staining wool	—	1
Sea water — alteration	2	3
staining wool	2	1
Stoving	4-5	5
Washing — alteration	2-3	1
staining wool	2-3	3
OTHER PROPERTIES		
Dischargeability	Not dischargeable	
Effect of metals — copper	Duller	
chromium	—	
iron	Redder and duller	
NON-TEXTILE USAGE	See Leather Dyes section Paper: dyeing in the beater, staining and colouring of crêpe tissues Pigments: barium salt used in printing inks, especially for tinplate. Soaps and wax emulsions. Biological stain; drugs and cosmetics See C.I. Food Yellow 13	Heavy metal salts used as pigments
NOTES		



5	6	7	C.I. Acid Yellow
Quinoline 47035	Monoazo 13100	Aminoketone 56205	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Bright greenish yellow —	Reddish yellow Rather greener	Bright greenish yellow Redder and duller	HUE Daylight Artificial light (tungsten)
3  Good; can be salted — Acetate—s, cellulose—ss	3  Good — Silk—hs, cellulose and acetate —ss	3  Good — Nylon—d, silk—hs, cellulose and acetate—u	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Silk: broken degumming liquor or acid Orlon: cuprous ion method (exhaustion: very good)	Silk: broken degumming liquor with formic or sulphuric acid Jute and coir: acetic or formic acid or alum bath in a short liquor	Silk: broken degumming liquor (levelling: good) Nylon: formic acid	DYEING: OTHER FIBRES
Direct on wool, silk and nylon		Direct on wool, silk, and for illuminating formaldehyde sulphonylate discharges	PRINTING
ISO Wool 3-4 4 — — 4  1 2 3  2 — —  1 — 2-3 1 —  3 — 4 1-2 2	AATCC Orlon — — — — —  — 7 —  — — —  — 5 — — 3-4 —	ISO 3-4 4 — — 4  2 3 3-4  1-2 — —  1 — 2-3 2 —	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{8}$ - $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Not dischargeable Somewhat duller — Somewhat redder & duller	Poor Much duller — Redder, duller	Not dischargeable Little redder — Little redder	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
See Leather Dyes section Paper Pigments Wood stains See also C.I. Direct Yellow 5		See Leather Dyes section Paper: surface colouring and beater dyeing and coating In production of daylight fluorescent pigments and inks. Dyeing of melamine and urea resins	NON-TEXTILE USAGE
			NOTES

# C.I. Acid Yellow 8—11

C.I. Acid Yellow	8	9	9:1
CHEMICAL CLASS	Monoazo	Monoazo	Monoazo
C.I. CONSTITUTION NUMBER	—	13015	—
HUE Daylight Artificial light (tungsten)	Bright greenish yellow Slightly redder	Reddish yellow Little redder	Reddish yellow Little redder
DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres	3  Good — Silk— <i>hs</i> , Acetate and cellulose— <i>u</i>	3  Good; can be salted <sup>1/2</sup> Nylon— <i>d</i> , silk— <i>s</i> , acetate and cellulose— <i>u</i>	Slightly different chemically from C.I. Acid Yellow 9 but similar in properties and usage
DYEING: OTHER FIBRES	Silk: sulphuric acid	Silk: acetic acid Nylon: formic acid	
PRINTING	Direct on wool		
FASTNESS PROPERTIES Method	ISO	AATCC	ISO
Alkali	4	4	4-5
Carbonising	4	3	3-4
Chlorination — alteration	—	—	3
staining wool	—	—	5
Decatising	4	—	5
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	4	4	2
normal	4-5	4-5	3
2 × normal	5	5	3-4
Milling, alkaline — alteration	2-3	1	1
staining wool	—	1	4
Milling, acid — alteration	—	—	1
staining wool	—	—	1
Peroxide bleaching — alteration	—	2	1
staining wool	—	2	5
Perspiration	3-4	1	2
Potting — alteration	—	—	—
staining wool	—	—	—
Sea water — alteration	3-4	1-2	1
staining wool	—	1-2	2
Stoving	5	2	1
Washing — alteration	3	1	1
staining wool	—	1	5
OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron	Good Slightly changed — Slightly changed	Good Slightly duller — Much weaker	
NON-TEXTILE USAGE	Heavy metal salts are used as pigments	See Leather Dyes section Paper: beater dyeing, coating and surface colouring. The aluminium salt is used in inks for tinplate printing. Soap and casein. Biological stain See C.I. Food Yellow 2	
NOTES			

10	11	C.I. Acid Yellow	
Monoazo —	Monoazo 18820	CHEMICAL CLASS C.I. CONSTITUTION NUMBER	
Yellow Rather redder	Bright yellow Slightly redder	HUE Daylight Artificial light (tungsten)	
3  Good; can be salted 1/3 Acetate and cellulose—u	3  Good; can be salted at boil — Silk—hs, nylon—d, acetate—ss, cellulose—u	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres	
	Silk: sulphuric or acetic acid (levelling: good) Nylon: formic acid	DYEING: OTHER FIBRES	
	Direct on wool and silk	PRINTING	
ISO 4-5 3-4 4-5 — 4-5  6 7 7  1 3 3-4 1  1 4-5 3 3-4 1  2 2 4-5 2 4-5	AATCC 5 4-5 — — 5  — 6-7 —  2 — — —  1 — 1 —  3-4 — 4-5 2 2	ISO 4 4-5 4 — 4-5  5 5-6 6  1-2 — 2 —  2 — 2-3 2 —  2 — 4 1-2 2	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, 1/2—1/2 normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Good Severe change — Some change	Good Redder — Duller	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron	
Paper	See Leather Dyes section Paper: coating and surface colouring Heavy metal salts struck on alumina are used in lacquers, paints and enamels, also for textile printing. Resins, cellulose esters amd spirit varnishes. Drugs and cosmetics See C.I. Solvent Yellow 15	NON-TEXTILE USAGE	
		NOTES	



**C.I. Acid Yellow 11:1—16**

<b>C.I. Acid Yellow</b>	<b>11:1</b>	<b>12</b>	<b>13</b>
<b>CHEMICAL CLASS</b>	Monoazo	Monoazo	Monoazo
<b>C.I. CONSTITUTION NUMBER</b>	—	18830	19120
<b>HUE</b> Daylight Artificial light (tungsten)	Bright yellow Slightly redder	Yellow Slightly redder	Bright greenish yellow Little change
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	Slightly different chemically from C.I. Acid Yellow 11 but similar in properties and usage	3  Good; can be salted — Silk and acetate— <i>hs</i> , cellulose— <i>ss</i>	3  Good; can be salted — Acetate and cellulose— <i>u</i>
<b>DYEING: OTHER FIBRES</b>		Silk: sulphuric or acetic acid	Silk: broken degumming liquor, levelling: good
<b>PRINTING</b>			Direct on wool
<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{8}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool		ISO  4 5 4 — 5  4 5 6  1 — 2-3 —  4 — 2-3 1 —  2-3 — 4 2-3 —	ISO  3-4 4-5 — — 4-5  5-6 6 6-7  1-2 — — —  1-2 — 3 — —  3 — 4 2 4
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron		Good Much redder — Redder	Dischargeable to white Slightly redder — Duller and greener
<b>NON-TEXTILE USAGE</b>		Barium salt is used in rubber and synthetic resins	Heavy metal salts have pigment usage
<b>NOTES</b>			<b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—yellowish orange

14	15	16	C.I. Acid Yellow
Monoazo 18960	Monoazo —	Monoazo 13085	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Bright yellow —	Yellow Redder	Reddish yellow —	HUE Daylight Artificial light (tungsten)
3 Good; can be salted at boil — —	3 Good — Acetate and cellulose—u	2 Moderate — —	DYEING: WOOL Method Levelling S.D.C. migration test method/grade Staining other fibres
Silk: broken degumming liquor	Nylon: sulphuric or formic acid	Silk: degumming liquor made slightly acid	DYEING: OTHER FIBRES
	Direct on wool		PRINTING
ISO 3-4 4-5 — — 4-5 5-6 6 6-7 1-2 — — — 1-2 — 3 — — 3 — 4 2 4	AATCC 2 3 — 5 4 6 7 2 — — — — 1 — — 2-3 5 2 —	ISO 5 5 4 — 5 6 6 — — — 4-5 4-5 — — 3 — — 4 5 2 —	FASTNESS PROPERTIES Method Alkali Carbonising Chlorination — alteration staining wool Decatising Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool Sea water — alteration staining wool Stoving Washing — alteration staining wool
	Good Much redder — Duller		OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
	Paper dyeing and produc- tion of precipitated colour lakes	Indicator (pH range 7.4- 8.6)	NON-TEXTILE USAGE
			NOTES

# C.I. Acid Yellow 17—21

C.I. Acid Yellow	17	17:1	18
CHEMICAL CLASS	Monoazo	Monoazo	Monoazo
C.I. CONSTITUTION NUMBER	18965	—	19020
HUE Daylight Artificial light (tungsten)	Bright yellow Little change	Bright yellow Little change	Greenish yellow Little change
DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres	3  — I/4 Acetate and cellulose—u	Slightly different chemically from C.I. Acid Yellow 17 but similar in properties and usage	3  Good; can be salted at boil — Acetate and cellulose—u
DYEING: OTHER FIBRES	Silk: formic or sulphuric acid (levelling: good) Nylon: formic acid bath (good exhaustion)		Silk: broken degumming liquor (levels well)
PRINTING	Direct on wool and silk		Direct on wool and silk
FASTNESS PROPERTIES Method	AATCC	ISO	ISO
Alkali	2-3	3-4	3
Carbonising	5	5	4
Chlorination — alteration	3-4	5	—
staining wool	3-4	5	—
Decatising	5	4-5	4
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal	6	6-7	5-6
normal	7	7	6
2 × normal	7	7-8	6-7
Milling, alkaline — alteration	2	1	2
staining wool	2	1	—
Milling, acid — alteration	—	4	3
staining wool	—	1	—
Peroxide bleaching — alteration	1	1	—
staining wool	1	5	—
Perspiration	1	4-5	2-3
Potting — alteration	5	3-4	—
staining wool	5	2	—
Sea water — alteration	3-4	4-5	2-3
staining wool	3-4	2	—
Stoving	4-5	5	4
Washing — alteration	2	2	2
staining wool	2	5	3-4
OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron	Good Slightly redder and duller — Duller		Good Somewhat redder — Greener and duller
NON-TEXTILE USAGE	Paper: surface colouring and staining of crêpe tissue Barium salt is used for paper coating Anodised aluminium Formaldehyde resins & casein See Leather Dyes section		
NOTES			



19	20	21	C.I. Acid Yellow
Azo —	Monoazo 14225	Monoazo 14230	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Yellow Redder	Dull reddish yellow Little redder	Reddish yellow Redder	HUE Daylight Artificial light (tungsten)
2 or 3  Good (acetic acid)** II/3 Acetate, cellulose and poly- ester— <i>u</i> , triacetate— <i>ss-u</i>	3  Good — Acetate and cellulose— <i>ss</i>	3  Good — Acetate and cellulose— <i>u</i>	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Silk: acetic, formic or sulph- uric acid (levelling: good)	Silk: broken degumming liquor		DYEING: OTHER FIBRES
Direct on wool and silk		Direct on wool and silk	PRINTING
ISO Wool      Nylon 4      — 5      — 4      5† —      — 5      4-5  4-5      5 5      5-6 5-6      6-7  2      — 3      — 3      — 2      —  4      — —      — 4      4-5 —      — —      —  4      4 4      3-4 4-5      — 4-5      4-5* 5      4-5	ISO 1 3-4 — — 5  4-5 5 5-6  1-2 — 2 —  1 — 2 — —  2-3 — 2 1 2	ISO 4 4-5 — — 4  5 5-6 6  1-2 — — —  — — 3 — —  2-3 — 5 2-3 —	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool  Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool  Perspiration Potting — alteration staining wool  Sea water — alteration staining wool  Stoving Washing — alteration staining wool
5 (wool), 4 (nylon) Duller Unaffected Slightly duller	Good Duller — Destroyed	Dischargeable to white Slight change — Moderate change	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
		Metal salts have pigment usage	NON-TEXTILE USAGE
**moderate (sulphuric acid bath) †chlorinated water Solubility: 50g/l *in syntan-treated patterns			NOTES

### C.I. Acid Yellow 22—27

C.I. Acid Yellow	22	23	24
<b>CHEMICAL CLASS</b>	Monoazo	Monoazo	Nitro
<b>C.I. CONSTITUTION NUMBER</b>	—	19140	10315
<b>HUE</b> Daylight Artificial light (tungsten)	Greenish yellow Slightly redder	Yellow Slightly redder	Yellow —
<b>DYEING: WOOL</b> Method	3	3	Rarely used 2
Levelling S.D.C. migration test method/grade Staining other fibres	Good — Acetate and cellulose— <i>u</i>	Moderate to good I/3 Acetate and cellulose— <i>u</i>	— — —
<b>DYEING: OTHER FIBRES</b>	Silk: sulphuric acid bath (levelling: good)	Silk: formic or sulphuric acid (levelling: moderate to good) Nylon: formic acid	Silk: dyed from a weakly acid bath (rarely used)
<b>PRINTING</b>	Direct on wool and silk	Direct on wool and silk	
<b>FASTNESS PROPERTIES</b> Method	ISO	AATCC	ISO
Alkali	4	3	3-4
Carbonising	4	5	4-5
Chlorination — alteration	—	—	5
staining wool	—	—	5
Decatising	4-5	4-5	4-5
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal	5-6	3	3
normal	6	4	4
2 × normal	7	5	4-5
Milling, alkaline — alteration	2-3	2	1
staining wool	—	2	4
Milling, acid — alteration	—	—	3
staining wool	—	—	1
Peroxide bleaching — alteration	—	1	1
staining wool	—	1	5
Perspiration	3-4	3	4-5
Potting — alteration	—	5	3-4
staining wool	—	5	2
Sea water — alteration	3	3	2
staining wool	—	3	3
Stoving	4	4	4-5
Washing — alteration	3	2	2
staining wool	—	2	5
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Dischargeable to white Moderate change — Slight change	Dischargeable to white Somewhat redder — Weaker and duller	
<b>NON-TEXTILE USAGE</b>		Paper: surface staining and colouring of crêped tissues Barium salt is used for paper coating; a lake on alumina is used for transparent effects in tin printing See Leather Dyes section Miscellaneous: soap, casein plastics, anodised aluminium, writing inks, wood stains See C.I. Food Yellow 4	Limited use in varnishes Mothproofing agent
<b>NOTES</b>	<b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—yellow		

25	26	27	C.I. Acid Yellow
Monoazo 18835	Monoazo 13105	Monoazo 19130	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Yellow Little change	Yellow Little redder	Yellow Very slightly redder	HUE Daylight Artificial light (tungsten)
3  Suitable for salting I/4-5 Acetate and cellulose— <i>u</i>	3  Good; can be salted — Acetate— <i>hs</i> , cellulose — <i>ss</i>	3  Good I/4-5 Acetate and cellulose— <i>u</i>	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Silk: broken degumming liquor Nylon: formic acid	Silk: broken degum- ming liquor (levelling: good)	Silk: broken degum- ming liquor	DYEING: OTHER FIBRES
Direct on wool, silk and nylon		Direct on wool, silk and nylon	PRINTING
AATCC 4 4-5 2 — 5  6 6-7 7  3-4 3-4 — —  1 1 3-4 — —  4 — 5 4 4	ISO 1 4 — — 4-5  1-2 2 2  2 — — —  1-2 — 2 1-2 —  2-3 — 2 3 3	ISO 3-4 4-5 4-5 — 5  3 4 4-5  1 3 3-4 1  1 5 4 2-3 1  2-3 — 3-4 1 5	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Dischargeable to white (wool and silk) Slightly duller — Much duller	Poor Rather duller — Somewhat duller	Dischargeable to white Redder and duller — Duller	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
Paper: occasionally used for coating See Leather Dyes section Anodised aluminium	See Leather Dyes section	See Leather Dyes sec- tion Paper: staining and col- ouring of crêpe tissues Heavy metal salts used as pigments	NON-TEXTILE USAGE
*Fastness on nylon: Light 5-6, 5-6, 5-6; Perspiration† 4-5; Washing 4-5, 4-5 †Syntan aftertreated before testing			NOTES



# C.I. Acid Yellow 28—32

C.I. Acid Yellow	28	29	29:1
CHEMICAL CLASS	—	Monoazo	—
C.I. CONSTITUTION NUMBER	—	18900	—
HUE Daylight Artificial light (tungsten)	Bright greenish yellow Lighter	Yellow Slightly redder	Yellow —
DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres	3  Good — Acetate and cellulose—u	2, 3  Good I/3-4 Acetate—ss, cellulose—u	Slightly different chemically from C.I. Acid Yellow 29 but similar in properties
DYEING: OTHER FIBRES	Silk: acid (levelling: good) Washing fastness a little lower than on wool	Silk: acid or neutral bath or broken degumming liquor Nylon: acid	
PRINTING	Direct on wool, silk and nylon	Direct on wool and silk	
FASTNESS PROPERTIES Method	ISO	AATCC Wool	ISO† Wool
Alkali	3	3	3
Carbonising	3	5	3
Chlorination — alteration	4-5	5	3
staining wool	—	5	5
Decatising	4	5	2
Light, $\frac{1}{2}$ — normal	4	5	6
normal	5	5-6	6-7
2 × normal	6	6-7	7
Milling, alkaline — alteration	—	2	1
staining wool	—	2	1
Milling, acid — alteration	1-2	—	3-4
staining wool	—	—	1
Peroxide bleaching — alteration	—	—	1
staining wool	—	—	1
Perspiration	3-4	4-5	4
Potting — alteration	—	—	1
staining wool	—	—	1
Sea water — alteration	—	4	4
staining wool	—	—	—
Stoving	5	4	4-5
Washing — alteration	3-4	4-5	2
staining wool	5	4-5	4-5
OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron	Good Little change Unaffected Slightly duller	Good Much redder — Much duller	
NON-TEXTILE USAGE		See Leather Dyes section	
NOTES		†Fastness on nylon: Light 4-5, 5, 5-6; Perspiration 4-5*; Washing 4-5*, 4-5  *Syntan aftertreated before testing (acid perspiration)	

30	31	32	C.I. Acid Yellow
Monoazo —	Monoazo —	— —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Yellow —	Yellow Redder	Yellow Redder	HUE Daylight Artificial light (tungsten)
3  Good; can be salted — Acetate and cellulose— <i>u</i>	3  Moderate to good I/3 Acetate and cellulose— <i>u</i>	2, 3  — I/2 Acetate and cellulose— <i>ss</i>	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
			DYEING: OTHER FIBRES
	Direct on wool		PRINTING
ISO  3 4-5 4-5 — 4-5  6 6-7 6-7  4 3 — —  1 3-4 3 — —  4 3 4-5 4 3-4	ISO  4 4 5 — 5  5 5-6 6  1 4 4 1  1 5 4 — —  3 3-4 5 2 5	ISO  — 3 2 4 4  4-5 5 5-6  1 3 1 1  1 5 2 1 1  1 2 1 1 5	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{8}$ - $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — altera ion staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Good Duller — Duller	Good Severe change — Severe change	Good Slightly duller — Duller	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
	Paper Pigments: as heavy metal salts		NON-TEXTILE USAGE
			NOTES

### C.I. Acid Yellow 33—38

C.I. Acid Yellow	33	34	35
CHEMICAL CLASS	Monoazo	Monoazo	Azo
C.I. CONSTITUTION NUMBER	13115	18890	—
HUE			
Daylight	Reddish yellow	Bright yellow	Greenish yellow
Artificial light (tungsten)	Little change	Little change	Unchanged
DYEING: WOOL			
Method	3	3	
Levelling	Good	Good	
S.D.C. migration test method/grade	—	—	
Staining other fibres	Acetate— <i>hs</i> , cellulose— <i>u</i>	Acetate and cellulose— <i>u</i>	
DYEING: OTHER FIBRES			
	Silk: broken degumming liquor Wet fastness properties improved by tannin-tartar emetic treatment	Silk: sulphuric acid (levelling: good) Nylon: sulphuric acid	
PRINTING			
	Direct on wool and silk	Direct on wool and silk	Silk and tin-weighted silk
FASTNESS PROPERTIES			
Method	ISO	AATCC	AATCC
Alkali	3-4	3	—
Carbonising	3	4	—
Chlorination — alteration	—	—	—
staining wool	—	—	—
Decatising	3-4	3	—
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal	1-2	—	—
normal	2	7	6
2 × normal	2-3	—	—
Milling, alkaline — alteration	1-2	1	5
staining wool	—	—	—
Milling, acid — alteration	—	—	—
staining wool	—	—	—
Peroxide bleaching — alteration	2	—	—
staining wool	—	—	—
Perspiration	2	2	4-5
Potting — alteration	1	—	—
staining wool	—	—	—
Sea water — alteration	2	1	—
staining wool	—	—	—
Stoving	3	4	—
Washing — alteration	2	2	4-5
staining wool	1-2	—	—
OTHER PROPERTIES			
Dischargeability	Fair	Very good	
Effect of metals — copper	Somewhat duller	Destroyed	
chromium	—	—	
iron	Duller	Much weaker	
NON-TEXTILE USAGE			
		Paper: occasionally in beater dyeing Pigment: as barium salt Surface coating of casein plastics, from sulphuric acid bath See Leather Dyes section	
NOTES			
			Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—lemon yellow



36	37	38	C.I. Acid Yellow
Monoazo 13065	Azo —	Disazo 25135	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Reddish yellow→orange Redder	Yellow Slightly redder	Yellow Slightly redder and brighter	HUE Daylight Artificial light (tungsten)
3 — I/4 Acetate and cellulose—ss	3 Good; suitable for salting — Acetate and cellulose—u	1, 2 Moderate — Acetate and cellulose—u	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Silk Jute and the like	Silk: sulphuric acid (level- ling: good) Fastness properties as on wool	Silk: acetic acid Nylon: acetic or formic acid	DYEING: OTHER FIBRES
Direct on wool and silk		Direct on wool and silk	PRINTING
AATCC      ISO	ISO	AATCC      ISO	FASTNESS PROPERTIES Method
5      4	3-4	5      4	Alkali
4      3-4	4-5	4-5      4	Carbonising
—      3	—	2      4-5	Chlorination — alteration
—      —	—	—      —	staining wool
4      4	4	5      —	Decatising
2      2	5-6	4      4-5	Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal
3      3	6	5      5	normal
4      4	6-7	6      5-6	2 × normal
1      1-2	1-2	3      4	Milling, alkaline — alteration
—      —	—	3      5	staining wool
—      —	—	—      4	Milling, acid — alteration
—      —	—	—      4	staining wool
—      —	—	3-4      3-4	Peroxide bleaching — alteration
—      —	—	3-4      4	staining wool
4      2-3	3	4      4	Perspiration
—      —	—	—      —	Potting — alteration
—      —	—	—      —	staining wool
5      —	3	4-5      4-5	Sea water — alteration
1      —	—	—      —	staining wool
1      2	3-4	5      4	Stoving
1      2	2-3	3-4      4-5	Washing — alteration
—      —	—	3-4      4	staining wool
Good Greener and duller Little change Much weaker	Good Moderate change — Slight change	Dischargeable to white Greener and duller No change Redder and duller	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
Paper: good colour value but not fast to acids Pigments: heavy metal salts Soaps, wood stains, polishes, lacquers, biological stain, indicator (pH 1-3) and in drugs and cosmetics See Leather Dyes section	Pigments: as heavy metal salts See Leather Dyes section	Paper: beater dyeing Cellulose acetate in injection moulding See Leather Dyes section	NON-TEXTILE USAGE
	Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—yellow		NOTES

# C.I. Acid Yellow 39—42:1

C.I. Acid Yellow	39	40	40:1
<b>CHEMICAL CLASS</b>	Monoazo	Monoazo	Monoazo
<b>C.I. CONSTITUTION NUMBER</b>	—	18950	—
<b>HUE</b> Daylight Artificial light (tungsten)	Yellow Slightly redder	Yellow Little change	Yellow Little change
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	3  Good; can be salted — Acetate— <i>ss</i> , cellulose— <i>u</i>	2  — II/3-4 Acetate and cellulose— <i>u</i>	Slightly different chemically from C.I. Acid Yellow 40 but similar in properties and usage
<b>DYEING: OTHER FIBRES</b>	Silk: acetic acid (levelling: good) Wet fastness properties lower than on wool	Silk: acetic acid or neutral (levelling: good) Nylon: ammonium sulphate	
<b>PRINTING</b>	Direct on wool and silk	Direct on wool and silk	
<b>FASTNESS PROPERTIES</b> Method	ISO	AATCC*      ISO	
Alkali	3	5	5
Carbonising	5	4-5	4
Chlorination — alteration	2	2	4
staining wool	—	2	5
Decatising	5	4-5	5
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	5	—	4
normal	6	5	4-5
2 × normal	7	—	5
Milling, alkaline — alteration	2-3	2-3	1
staining wool	—	2-3	2
Milling, acid — alteration	4	—	4
staining wool	—	—	1
Peroxide bleaching — alteration	3	2	1
staining wool	—	2	3
Perspiration	3	4-5	4-5
Potting — alteration	2	1	1
staining wool	—	1	1
Sea water — alteration	4	3	4-5
staining wool	—	3	4
Stoving	4	5	4
Washing — alteration	3-4	2-3	1
staining wool	—	2-3	4
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Dischargeable to white Slightly redder — Much duller	Good Little change No change Duller	
<b>NON-TEXTILE USAGE</b>	Anodised aluminium Paper	Drugs and cosmetics See Leather Dyes section	
<b>NOTES</b>		*Fastness on nylon: Light 6; Perspiration 3; Washing 4-5; Dry cleaning (AATCC) 4-5 Solubility in water: good	

<b>41</b>	<b>42</b>	<b>42:1</b>	<b>C.I. Acid Yellow</b>
Monoazo <b>19025</b>	Disazo <b>22910</b>	Disazo —	<b>CHEMICAL CLASS</b> <b>C.I. CONSTITUTION NUMBER</b>
Yellow Redder	Yellow→reddish yellow Redder	Yellow→reddish yellow Redder	<b>HUE</b> Daylight Artificial light (tungsten)
3  Good; can be salted — Acetate and cellulose— <i>u</i>	1, 2  — III/1 Acetate and cellulose— <i>ss</i>	Slightly different chemically from C.I. Acid Yellow 42 but similar in properties and usage	<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres
Silk: broken degumming liquor Fastness to light, perspiration and stoving lower than on wool			<b>DYEING: OTHER FIBRES</b>
Direct on wool and silk	Direct on wool, silk and viscose		<b>PRINTING</b>
ISO 3-4 4-5 — 4-5  5-6 6 6-7  1-2 — — —  1-2 — 2-3 — —  2-3 — 4 2 3	AATCC 4-5 5 2 — 5  3 4 5  — 3-4 — —  1 2-3 4-5 — —  4-5 4-5 5 4-5 4-5	ISO* 5 4 5 — 4-5  4 4-5 5  2 3-4 4 4-5  4 5 4-5 4-5 5 4-5 5	<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool  Decatising  Light, $\frac{1}{2}$ - $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Good Much duller Unchanged Redder and duller	Fairly good Slightly redder and duller No change Greener and duller		<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron
	See Leather Dyes section Metal salts used in printing inks and paper coatings Straw, casein and soap		<b>NON-TEXTILE USAGE</b>
	*Fastness on nylon: Light 4, 4-5, 5; Perspiration 5; Washing 5, 4-5 Solubility in water: good		<b>NOTES</b>



**C.I. Acid Yellow 43—48**

<b>C.I. Acid Yellow</b>	<b>43</b>	<b>44</b>	<b>45</b>
<b>CHEMICAL CLASS</b>	Monoazo	Disazo	—
<b>C.I. CONSTITUTION NUMBER</b>	—	23900	—
<b>HUE</b> Daylight Artificial light (tungsten)	Bright yellow Slightly redder	Greenish yellow Slightly redder	
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	3  Good — Acetate and cellulose—u	1, 2  Moderate IV/1 Acetate and cellulose—u	This C.I. Generic Name is discontinued; the dyes formerly listed under it now appear under C.I. Acid Yellow 13
<b>DYEING: OTHER FIBRES</b>		Silk: neutral or weakly acid or broken degumming liquor. Levelling: good	
<b>PRINTING</b>	Direct and discharge styles on wool	Direct on wool, silk and viscose by the urea process	
<b>FASTNESS PROPERTIES</b> Method	AATCC	AATCC	ISO*
Alkali	5	4	4
Carbonising	3	4-5	4
Chlorination — alteration	—	—	5
staining wool	—	—	5
Decatising	—	4-5	5
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	—	4	3
normal	6-7	5	4
2 × normal	—	5	4-5
Milling, alkaline — alteration	1	3-4	4-5
staining wool	—	3-4	4
Milling, acid — alteration	—	—	4
staining wool	—	3-4	4-5
Peroxide bleaching — alteration	1	4	5
staining wool	—	4	5
Perspiration	1	4	5
Potting — alteration	—	—	3-4
staining wool	—	—	1
Sea water — alteration	5	4-5	4-5
staining wool	3	4-5	4-5
Stoving	5	4	4-5
Washing — alteration	1-2	3-4	5
staining wool	—	3-4	4-5
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Good Much redder and duller — Much redder and duller	Dischargeable to white (wool and silk) Somewhat duller No change Somewhat redder and duller	
<b>NON-TEXTILE USAGE</b>		Paper See Leather Dyes section	
<b>NOTES</b>	<b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—yellow	*Fastness on nylon: Light 3-4, 4, 4-5; Perspiration (acid) 4-5, 2; Washing 5, 5	

46	47	48	C.I. Acid Yellow
Monoazo —	— —	Monoazo  18970	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Yellow Slightly redder	Greenish yellow Little change	Yellow Weaker	HUE Daylight Artificial light (tungsten)
3  Moderate — Acetate and cellulose— <i>u</i>	3  Good — Acetate and cellulose— <i>u</i>	1, 2  Good — —	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Silk: acetic acid (levelling: good) Fastness to water, washing, perspiration and milling lower than on wool	Silk: sulphuric or acetic acid (levelling: good) Wet fastness properties are lower than on wool	Silk: slightly acid	DYEING: OTHER FIBRES
Direct on silk	Direct on wool and silk		PRINTING
ISO  3-4 4 4 — 5  4 5-6 6  2-3 — 4 —  3-4 — 2-3 1-2 —  3-4 — 4 3-4 —	ISO  5 3-4 5 — 5  5 5 6  — — 2 —  5 — 4 — —  — — 5 5 5		FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Dischargeable to white Slightly redder — Much duller	Dischargeable to white Somewhat duller — Slightly duller		OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
Anodised aluminium Paper Pigments: heavy metal salts			NON-TEXTILE USAGE
		Good fastness to light and wet treatments	NOTES

**C.I. Acid Yellow 49—54**

<b>C.I. Acid Yellow</b>	<b>49</b>	<b>50</b>	<b>51</b>
<b>CHEMICAL CLASS</b>	—	—	Disazo
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Bright yellow Slightly redder and weaker	Yellow Redder	Yellow Slightly redder
<b>DYEING: WOOL</b> Method	3	1, 2	1, 2
Levelling — S.D.C. migration test method/grade Staining other fibres	Good — Silk— <i>hs</i> , acetate— <i>ss</i> , cellulose— <i>u</i>	— IV/2 Cotton— <i>ss</i> , viscose and acetate— <i>u</i>	Poor to moderate IV/1 Cellulose and acetate— <i>u</i>
<b>DYEING: OTHER FIBRES</b>		Silk: acetic acid (levels well)	Silk: neutral or broken degumming liquor
<b>PRINTING</b>		Direct on wool and silk	Direct on wool and silk
<b>FASTNESS PROPERTIES</b> Method	ISO	ISO	AATCC ISO
Alkali	4	5	4 5
Carbonising	4	4-5	5 4-5
Chlorination — alteration	—	4	— 4-5
staining wool	—	4-5	—
Decatising	4-5	5	4-5 5
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	5	5	4 5
normal	5-6	6	5 5-6
2 × normal	6	6-7	6 6
Milling, alkaline — alteration	1-2	5	3 2-3
staining wool	2-3	5	3 4
Milling, acid — alteration	3-4	4-5	— 4-5
staining wool	—	4	— 4-5
Peroxide bleaching — alteration	3	4	— 4-5
staining wool	3-4	4	— 4-5
Perspiration	3	4-5	3 4-5
Potting — alteration	—	3-4	— 3
staining wool	—	3-4	— 1
Sea water — alteration	3	4-5	5 5
staining wool	2-3	5	5 5
Stoving	4	4-5	5 5
Washing — alteration	2-3	4	4 4-5
staining wool	3	4	4 5
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Good Little duller — Little duller	Very good Slightly duller — Somewhat duller	Good Redder and duller Little change Slightly duller
<b>NON-TEXTILE USAGE</b>		Paper	
<b>NOTES</b>			<b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—greenish yellow



52	53	54	C.I. Acid Yellow	
— —	Monoazo 18915	Monoazo (metallised) 19010	CHEMICAL CLASS C.I. CONSTITUTION NUMBER	
Yellow Little change	Yellow Little change	Yellow Redder	HUE Daylight Artificial light (tungsten)	
3  Good; can be salted — Cellulose and acetate— <i>u</i>	1, 2, 3  Good — Acetate— <i>ss</i> , cellulose— <i>u</i>	3  Good — Silk and nylon— <i>s</i> , cellulose and acetate— <i>u</i>	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres	
Silk: sulphuric or acetic acid or neutral; levels well	Silk: broken degumming liquor		DYEING: OTHER FIBRES	
Direct on wool, silk and nylon	Direct on wool	Direct on wool and silk	PRINTING	
ISO 4 3-4 5 — 5 4-5 5 6 — — 2 — — — 4 — — 2 — 5 4 5	ISO 5 5 — — 5 4 4-5 5 2-3 — — — 1 — 4 — — — 4 — 5 2 3-4	AATCC 3 5 — — 4 6 7 7-8 3 3 — — 4 — — 5 — 5 5	ISO 4-5 4 5 — 4 6 6-7 7 3 5 4-5 5 3 — 3-4 3-4 — 4-5 — 5 3 4	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Dischargeable to white Unaffected Unaffected Unaffected	Good Redder and much duller — Much weaker	Good Slightly redder — Duller	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron	
		See Leather Dyes section	NON-TEXTILE USAGE	
Fastness on silk is lower than on wool			NOTES	

# C.I. Acid Yellow 55—60

C.I. Acid Yellow	55	56	57
CHEMICAL CLASS	Monoazo	Disazo	—
C.I. CONSTITUTION NUMBER	19040	24825	—
HUE Daylight Artificial light (tungsten)	Bright yellow —	Greenish yellow Brighter	
DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres	3  Good Cellulose— <i>u</i> , acetate— <i>ss</i>	2  Moderate; unsuited for salting — Cellulose and acetate— <i>u</i>	
DYEING: OTHER FIBRES	Silk: broken degumming liquor; levels well	Silk: weak acid; light and wet fastness properties little lower than on wool	
PRINTING	Direct on wool and silk		
FASTNESS PROPERTIES Method	ISO	ISO	
Alkali	5	4	
Carbonising	3-4	4	
Chlorination — alteration staining wool	—	3-4	
Decatising	5	5	
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	4	4	
normal	4-5	4-5	
2 × normal	5	5	
Milling, alkaline — alteration staining wool	2-3	4	
Milling, acid — alteration staining wool	—	—	
Peroxide bleaching — alteration staining wool	1	4-5	
Perspiration	4	4-5	
Potting — alteration staining wool	—	—	
Sea water — alteration staining wool	4	4-5	
Stoving	5	4	
Washing — alteration staining wool	3	4-5	
OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron	Dischargeable to white Much duller Little effect Somewhat duller	Good Slightly redder Little effect Little duller	
NON-TEXTILE USAGE		Pigments See Leather Dyes section	See Leather Dyes section
NOTES			

58	59	60	C.I. Acid Yellow
— —	Azo (metallised) —	Monoazo —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
This C.I. Generic Name is discontinued. The dyes formerly listed under it now appear under C.I. Acid Yellow 5	Reddish yellow Somewhat redder  1, 2  Good —	Bright greenish yellow —  3  Good — Acetate and cellulose—u	HUE Daylight Artificial light (tungsten)  DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
	Silk: acetic acid or neutral (levelling: good) Nylon: ammonium acetate (levelling: good)	Silk: sulphuric acid Nylon: acetic or formic acid	DYEING: OTHER FIBRES
	Direct on wool, silk and nylon Vigoureux printing		PRINTING
	ISO 5 4-5 4-5 4 5  6-7 7 7-8  4-5 4-5 3-4 4-5  4-5 3 5 2 1  5 4 4 4-5 4	AATCC 2 5 1 — —  5 —  1 — — —  1 — 1-2 — —  2 — — 3 —	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ - $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
	Good — Little change —	— Redder and duller — Redder and duller	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
	See Leather Dyes section	Paper: coating and surface colouring Barium salt used as a pigment in printing inks	NON-TEXTILE USAGE
		Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—orange	NOTES

# C.I. Acid Yellow 61—66

C.I. Acid Yellow	61	62	63	
CHEMICAL CLASS	—	—	Monoazo	
C.I. CONSTITUTION NUMBER	—	—	13095	
HUE Daylight Artificial light (tungsten)	Yellow Slightly greener	Yellowish orange —	Reddish yellow Little redder	
DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres	1, 2  Good; can be salted — Acetate and cellulose—ss		2  — I/2-3 Acetate—hs, cellulose—ss	
DYEING: OTHER FIBRES	Silk: acetic acid or neutral (levelling: good) Washing fastness a little lower than on wool	Suitable for silk	Silk: broken degumming liquor, acetic acid bath Nylon: acetic acid or neutral Bast fibres	
PRINTING	Direct on wool and silk		Direct on wool and silk	
FASTNESS PROPERTIES Method	AATCC	ISO	AATCC	ISO
Alkali	3-4	3-4	2	3-4
Carbonising	4-5	5	5	4
Chlorination — alteration	4	3-4	—	4-5
staining wool	—	—	—	3
Decatising	5	5	4	4
Light, 1/3-1/2 normal	5	5	1	2
normal	5-6	5-6	1	2
2 × normal	6	6	2	3
Milling, alkaline — alteration	4	3	1	1
staining wool	4	3	1	1
Milling, acid — alteration	—	—	—	3
staining wool	—	—	—	1
Peroxide bleaching — alteration	—	—	2	1
staining wool	—	—	2	1
Perspiration	4-5	4	1	4
Potting — alteration	—	—	—	1
staining wool	—	—	—	1
Sea water — alteration	4-5	4-5	2-3	3-4
staining wool	—	—	2-3	2
Stoving	5	5	1	3
Washing — alteration	4-5	4	1	1
staining wool	4-5	5	1	1
OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron	Good Greener and duller Little change Duller		Fairly good Duller — Much duller	
NON-TEXTILE USAGE	See Leather Dyes section	See Leather Dyes section	See Leather Dyes section Pigments: as heavy metal salts Paper Soap	
NOTES				



64	65	66	C.I. Acid Yellow
Azo —	Monoazo 14170	Monoazo 13200	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Reddish yellow (acetate) Redder	Dull reddish yellow Browner	Yellow* —	HUE Daylight Artificial light (tungsten)
— — — Cellulose—ss	1, 2 — IV/2 Acetate—s, cellulose—ss		DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Acetate, delustred acetate and nylon: neutral or weakly acid at 70–85°C Silk, wool and acetate dyed to similar depth	Silk: acetic acid or neutral (levelling: moderate) Nylon: acid	Acetate: acetic acid	DYEING: OTHER FIBRES
Direct and discharge printing of acetate and nylon	Direct on wool, silk and viscose	Acetate: discharge prints	PRINTING
ISO Acetate*      Nylon† 5                — —                — —                — —                — —                —  6                6 6                6–7 6–7            6–7  —                — —                — —                — —                —  —                — —                — 4                5 —                — —                — —                — —                — 5                5 —                —	ISO 4 4 5 5 4–5  4 4–5 5  3 4–5 4 3–4  4 3 5 —  3 5 4 3 2	ISO Direct    Dev    Dev    Dev    Dev† 5        4        3        3        2  —        1        2        4        2 4        1        3        5–6    2 —        2        4        6        3          3        4        3–4    2–3    4–5       3        5        4        4        5	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ – $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
	Moderate to good Little change — Slightly duller	Reactions on acetate (direct dyeing) H <sub>2</sub> SO <sub>4</sub> conc.—yellowish orange, on diln—reddish orange	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
Surface dyeing of casein and methyl methacrylate plastics Woolled sheepskins and furs	Soap See Leather Dyes section		NON-TEXTILE USAGE
Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—bright red- dish blue *Gas fume fading 5, Hot pressing 5, Steaming 5 †Water 5		*Diazotised and developed with β-naphthol—bright bluish red, resorcinol—dull yellowish red, phenol—bright reddish yel- low, 3 hydroxy-2-naphthoic acid—bright violet †Developers in above order.	NOTES

### C.I. Acid Yellow 67—72

C.I. Acid Yellow	67	68	69
CHEMICAL CLASS	Disazo	Disazo	Monoazo
C.I. CONSTITUTION NUMBER	—	23270	13135
HUE			
Daylight	Yellow→reddish yellow	Yellow	Reddish yellow
Artificial light (tungsten)	Somewhat redder	Weaker	—
DYEING: WOOL			
Method	2	2	2, 3
Levelling	Fairly good	Good	—
S.D.C. migration test method/grade	—	—	—
Staining other fibres	Acetate and cellulose— <i>u</i>	Acetate and cellulose— <i>ss</i>	—
DYEING: OTHER FIBRES			
	Silk: acid bath or broken degumming liquor; levelling: fairly good Nylon: acetic acid	Silk: broken degumming liquor; levelling: good Fastness properties similar to those on wool	Silk: as wool
PRINTING	Direct on wool and silk	Direct on wool and silk	
FASTNESS PROPERTIES			
Method	AATCC	ISO	ISO
Alkali	5	4-5	4
Carbonising	5	5	5
Chlorination — alteration	—	4	—
staining wool	—	—	—
Decatising	4	4-5	5
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	3	3	4
normal	4	4	4-5
2 × normal	5	4	5
Milling, alkaline — alteration	4	—	4
staining wool	4	—	—
Milling, acid — alteration	—	5	4-5
staining wool	—	5	—
Peroxide bleaching — alteration	—	—	2
staining wool	—	—	—
Perspiration	5	4	4-5
Potting — alteration	—	—	3
staining wool	—	—	—
Sea water — alteration	5	4	4-5
staining wool	—	—	—
Stoving	4	4-5	4-5
Washing — alteration	3-4	4-5	4-5
staining wool	3-4	5	4-5
OTHER PROPERTIES			
Dischargeability	Dischargeable to white	Moderate	
Effect of metals — copper	Duller	Duller	
chromium	Little effect	Duller	
iron	Slightly duller	—	
NON-TEXTILE USAGE	See Leather Dyes section		
NOTES	Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—reddish yellow		

70	71	72	C.I. Acid Yellow
Azo —	Azo —	Monoazo 18961	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Greenish yellow Redder	Yellow Redder	Greenish yellow Weaker	HUE Daylight Artificial light (tungsten)
1  Poor — Acetate and cellulose—u	1  Poor — Acetate and cellulose—u	1  Poor — Acetate and cellulose—ss	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Silk (weighted and unweigh- ted): neutral Fastness properties similar to those on wool but rather lower	Silk (weighted and unweigh- ted): neutral Fastness properties similar to those on wool but rather lower	Silk and nylon	DYEING: OTHER FIBRES
Direct on wool, silk and viscose	Direct on wool, silk and viscose	Direct on wool and silk	PRINTING
ISO Wool      Nylon 4-5      — 4*      — 5      — —      — 4-5      —  5-6      — 6      3-4 6-7      —  4-5      — 5      — 4*      — 4-5      —  3-4*      — 5      — 4-5      5 (acid) 4*      — 2      —  4-5      — 5      — 4-5      — 4-5 (ISO 2)      5 5      5	ISO 4-5 4-5 (redder) 5 — 4-5  5 5-6 6  4-5 5 4 4-5  4 4-5 4* 2  4-5 5 4-5 4-5 (ISO 2) 5	ISO 4-5 4-5 (redder) 5 — 4-5  4 4-5 4-5  4 (redder) 5 4-5 (pH 8) 4* 2-3  4-5 4-5 4-5 4-5 (ISO 2) 5	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Dischargeable to white 3 (redder, duller) 1 (duller) 3 (redder, duller)	Dischargeable to white 2 (redder, duller) 1 (duller) 4 (redder)	Good 2 (redder, duller) 1 (duller) 4-5 (redder)	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
Barium salt is used in paper coatings and wallpapers; fast to alkaline casein size	Barium salt is used in paper coatings and wallpapers; fast to alkaline casein size	Barium salt is used in paper coatings and wall- papers; fast to alkaline casein size	NON-TEXTILE USAGE
Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—greenish yel- low Solubility, good *Weaker, redder	Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—greenish yel- low Solubility, good *Weaker, redder	Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—dull yellow Solubility, good	NOTES

# C.I. Acid Yellow 73—78

C.I. Acid Yellow	73	74	75																																														
CHEMICAL CLASS	Xanthene	Xanthene	—																																														
C.I. CONSTITUTION NUMBER	45350	45360																																															
HUE Daylight Artificial light (tungsten)	Bright yellow —		Yellow Slightly redder																																														
DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres		Dyes wool and silk from a neutral or slightly acid bath, but has no practical value for textile application	1, 2  Good — Acetate and cellulose—u																																														
DYEING: OTHER FIBRES			Silk: acetic acid or neutral Levelling: good Fastness properties similar to those on wool																																														
PRINTING			Direct on wool and silk																																														
FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool			<table><tr><th>AATCC</th><th>ISO</th></tr><tr><td>4</td><td>4</td></tr><tr><td>4-5</td><td>4-5</td></tr><tr><td>4-5</td><td>4</td></tr><tr><td>—</td><td>—</td></tr><tr><td>5</td><td>5</td></tr><tr><td>4</td><td>4-5</td></tr><tr><td>4-5</td><td>5</td></tr><tr><td>5</td><td>5-6</td></tr><tr><td>4</td><td>3-4</td></tr><tr><td>4</td><td>4</td></tr><tr><td>—</td><td>—</td></tr><tr><td>—</td><td>—</td></tr><tr><td>—</td><td>—</td></tr><tr><td>—</td><td>—</td></tr><tr><td>4-5</td><td>4-5</td></tr><tr><td>—</td><td>—</td></tr><tr><td>—</td><td>—</td></tr><tr><td>5</td><td>5</td></tr><tr><td>—</td><td>—</td></tr><tr><td>5</td><td>5</td></tr><tr><td>4-5</td><td>4-5</td></tr><tr><td>4-5</td><td>5</td></tr></table>	AATCC	ISO	4	4	4-5	4-5	4-5	4	—	—	5	5	4	4-5	4-5	5	5	5-6	4	3-4	4	4	—	—	—	—	—	—	—	—	4-5	4-5	—	—	—	—	5	5	—	—	5	5	4-5	4-5	4-5	5
AATCC	ISO																																																
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4-5	4-5																																																
4-5	5																																																
OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron	Fluoresces strongly in aq soln even at great dilution	Fluoresces in aq soln	Good — Little change —																																														
NON-TEXTILE USAGE	As a marker for life saving at sea, tracing the course of underground streams, detecting water leaks, and medically to reveal weak circulation of blood Drugs and cosmetics	Similar to those of C.I. Acid Yellow 73 but less widely used																																															
NOTES			Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—yellowish orange																																														



76	77	78	C.I. Acid Yellow
Monoazo 18850	Azo (metallised) —	— —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Yellow Slightly redder	Yellow —	Yellow Redder	HUE Daylight Artificial light (tungsten)
2  Moderate — Acetate and cellulose—ss		1, 2  Good — Cotton—ss, viscose and acetate—u	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Silk: acetic acid Fastness properties some- what lower than on wool		Silk: acetic acid Levelling: good Fastness properties simi- lar to those on wool	DYEING: OTHER FIBRES
Direct on wool and silk		Direct on wool and silk	PRINTING
ISO  4 4 4-5 — 5  4 5 6-7  3 — 3 —  2-3 — 4-5 1-2 —  4-5 — 5 3-4 —		ISO  5 5 4-5 — 5  4-5 5 5-6  2 — 5 —  5 — 5 5 — 5 — 5 5 —	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Dischargeable to white Much duller Little change Slightly weaker		Good Little change — Little change	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
	Fastness on chrome tannage (ISO): Light 3-4	Paper	NON-TEXTILE USAGE
	Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—yellow		NOTES

# C.I. Acid Yellow 79—84

C.I. Acid Yellow	79	80	81
<b>CHEMICAL CLASS</b>	—	—	—
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Yellow Very slightly redder	Reddish yellow —	Yellow Slightly changed
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	2  Moderate — Acetate— <i>ss</i> , cellulose— <i>u</i>		1, 2  Good — Acetate and cellulose— <i>ss</i>
<b>DYEING: OTHER FIBRES</b>			Silk: acetic acid or neutral Levelling: good Fastness properties similar to those on wool
<b>PRINTING</b>			Direct on wool
<b>FASTNESS PROPERTIES</b> Method	ISO		AATCC      ISO
Alkali	4		—      4-5
Carbonising	4		5      5
Chlorination — alteration	—		—      5
staining wool	—		—      —
Decatising	4-5		5      5
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal	5-6		—      4
normal	6		6      4-5
2 × normal	6		—      5
Milling, alkaline — alteration	4		—      5
staining wool	4-5		—      —
Milling, acid — alteration	4-5		—      3-4
staining wool	4-5		—      —
Peroxide bleaching — alteration	3-4		—      5
staining wool	—		—      —
Perspiration	4-5		—      5
Potting — alteration	—		—      —
staining wool	—		—      —
Sea water — alteration	4-5		5      4
staining wool	4-5		—      —
Stoving	4-5		—      5
Washing — alteration	4		4      5
staining wool	3-4		4      5
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Good Little duller Little change Duller		Dischargeable to white Slightly duller Little change Slightly duller
<b>NON-TEXTILE USAGE</b>		See Leather Dyes section	
<b>NOTES</b>			

82	83	84	C.I. Acid Yellow
Disazo —	Disazo —	Disazo —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Yellow Redder		Greenish yellow Slightly redder	HUE Daylight Artificial light (tungsten)
1, 2  Moderate — Acetate and cellulose— <i>u</i>		2  Moderate — Acetate— <i>u</i> , cellulose— <i>ss</i>	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Silk: acetic acid		Silk: acetic acid or neutral Levelling: moderate Fastness properties similar to those on wool	DYEING: OTHER FIBRES
Direct on wool, silk and nylon; also discharge styles		Direct on wool, silk and viscose	PRINTING
AATCC  3 4 — —  3 4 4  3 — —  2 — 3 (Alk) — —  4 — 5 4 —		ISO  4-5 5 — — 5  1 2 2-3  4 — — —  — — 4 — —  4-5 — 5 4-5 —	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Good Redder and duller Little change Greener and duller		Poor Somewhat duller Little change Somewhat duller	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
See Leather Dyes section	See Leather Dyes section		NON-TEXTILE USAGE
Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—yellow		Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—yellowish orange	NOTES

# C.I. Acid Yellow 85—90

C.I. Acid Yellow	85	86	87
CHEMICAL CLASS	Azo	Disazo	Disazo
C.I. CONSTITUTION NUMBER	—	23310	22905
HUE Daylight Artificial light (tungsten)	Greenish yellow Redder	Yellow —	Yellow Little redder
DYEING: WOOL Method	2		1, 2
Levelling S.D.C. migration test method/grade Staining other fibres	Poor — Acetate and cellulose— <i>u</i>		Moderate — Acetate and cellulose— <i>u</i>
DYEING: OTHER FIBRES			Silk: broken degumming liquor. Unsuitable for weighted silk Fastness properties similar to those on wool
PRINTING	Direct on wool, silk and viscose		Direct on wool and silk
FASTNESS PROPERTIES Method			ISO
Alkali			5
Carbonising			4
Chlorination — alteration staining wool			—
Decatising			4
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal			2
normal			3
2 × normal			4
Milling, alkaline — alteration staining wool			3-4
Milling, acid — alteration staining wool			2
Peroxide bleaching — alteration staining wool			3
Perspiration			3-4
Potting — alteration staining wool			—
Sea water — alteration staining wool			4
Stoving			2
Washing — alteration staining wool			4-5
			3
OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron	Dischargeable to white Little greener and duller — Duller		Good Somewhat duller Little change Somewhat weaker
NON-TEXTILE USAGE	See Leather Dyes section Paper	See Leather Dyes section	Casein Paper
NOTES			



88	89	90	C.I. Acid Yellow
— —	— —	Disazo —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Yellow Slightly redder		Yellow Slightly redder	HUE Daylight Artificial light (tungsten)
2  Moderate — Acetate and cellulose—u		1, 2  Moderate — Acetate and cellulose—u	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
		Silk: neutral or acetic acid Nylon: acetic or formic acid	DYEING: OTHER FIBRES
Direct on wool and silk		Direct on wool and silk	PRINTING
ISO  3 — 3 — 4  4-5 5 5-6  1-2 5 5 —  — — 4 — —  5 — 4 3-4 5		AATCC  5 5 — — —  — 6 —  1 — — —  4 — 4 — —  4 — 5 3-4 —	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ - $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Good — — —		Good Slightly redder and duller — Very much redder and duller	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
	Properties on chrome tan- nage (ISO): Light 4, Penetration 2	See Leather Dyes section	NON-TEXTILE USAGE
		Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—brown	NOTES

# C.I. Acid Yellow 91—96

C.I. Acid Yellow	91	92	93
CHEMICAL CLASS	—	—	Monoazo (metallised)
C.I. CONSTITUTION NUMBER	—	—	—
HUE Daylight Artificial light (tungsten)	Dull yellow Brighter and redder		
DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres	1, 2  Moderate — Acetate—s, cellulose—ss		
DYEING: OTHER FIBRES	Silk: neutral or acetic acid		
PRINTING			
FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool	ISO  4-5 5 — — 5  3 3-4 4  4-5 — — —  — 4 — —  5 — 5 4-5 —		
OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron	Good Slightly duller Little effect Duller		
NON-TEXTILE USAGE		Leather: on vegetable, chrome and semi-chrome tannages	See Leather Dyes section
NOTES			Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—brown

94	95	96	C.I. Acid Yellow
Monoazo —	Azo —	— —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Reddish yellow —	Bright yellow Little change		HUE Daylight Artificial light (tungsten)
2  Moderate — Cellulose and acetate— <i>u</i>	1, 2  Fair — Acetate— <i>hs</i> , cellulose— <i>s</i>		DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Silk: weakly acid	Silk: neutral. Exhaustion and levelling: good Nylon: acetic acid		DYEING: OTHER FIBRES
Direct on wool and silk			PRINTING
ISO  3 5 — 5  — 7 —  5 — — —  — — 4 5 —  5 — 5 5 5	AATCC  3-4 4 — 4  — 3-4 —  3-4 — — —  — — 4-5 — —  4-5 4-5 — 3-4 —		FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
	Good Greener and duller — Greener and duller		OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
Leather		See Leather Dyes section	NON-TEXTILE USAGE
Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—reddish	Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—reddish violet		NOTES

# C.I. Acid Yellow 97—102

C.I. Acid Yellow	97	98	99
CHEMICAL CLASS	—	Monoazo (metallised)	Monoazo (metallised)
C.I. CONSTITUTION NUMBER	—	14006	13900
HUE Daylight Artificial light (tungsten)	Yellow Little change	Dull greenish yellow Somewhat greener	Reddish yellow Slightly redder
DYEING: WOOL Method	2	3	3
Levelling S.D.C. migration test method/grade Staining other fibres	Good; can be salted — Acetate and cellulose—u	Good; can be salted — Acetate and cellulose—u	Good — Acetate and cellulose—u
DYEING: OTHER FIBRES	Silk: acetic acid or neutral Hue is somewhat redder in tungsten light Fastness properties rather lower than on wool	Silk: broken degumming liquor. Levelling: good Nylon: sulphuric or formic acid	Silk: sulphuric acid or formic acid. Wet fastness prop- erties somewhat lower than on wool Nylon: formic acid
PRINTING	Direct on wool and silk	Direct on wool and silk	Direct on wool and silk
FASTNESS PROPERTIES Method	ISO	AATCC	ISO
Alkali	3-4	3-4	4
Carbonising	5	3	3-4
Chlorination — alteration	3-4	—	3-4
staining wool	—	—	—
Decatising	5	5	4-5
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal	5-6	4-5	4-5
normal	6	5	5
2 × normal	6-7	5	5-6
Milling, alkaline — alteration	3	3-4	3-4
staining wool	3-4	—	—
Milling, acid — alteration	—	—	3-4
staining wool	—	—	4
Peroxide bleaching — alteration	—	—	2
staining wool	—	—	—
Perspiration	4	3	4
Potting — alteration	—	—	3
staining wool	—	—	—
Sea water — alteration	4-5	3	4
staining wool	—	—	—
Stoving	5	5	4
Washing — alteration	4	3-4	4
staining wool	5	—	4
OTHER PROPERTIES			
Dischargeability	Good	Good	Poor
Effect of metals — copper	—	Slightly redder	Slightly weaker and duller
chromium	—	Little change	—
iron	—	Much duller	Redder and duller
NON-TEXTILE USAGE		Anodised aluminium See Leather Dyes section	Anodised aluminium Leather, especially glove and clothing leather See Leather Dyes section, also C.I. Solvent Yellow 19
NOTES			



100	101	102	C.I. Acid Yellow
Azo (metallised) 14091	Monoazo (metallised) —	Azo (metallised) —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Dull reddish yellow —	Dull greenish yellow Rather brighter and redder	Yellow Redder	HUE Daylight Artificial light (tungsten)
3  — Acetate— <i>hs</i> , cellulose— <i>u</i>	3  Good; can be salted — Acetate and cellulose— <i>u</i>	3  Good — Silk and nylon— <i>hs</i> , cotton and acetate— <i>ss</i> , viscose— <i>u</i>	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Silk: acetic acid or neutral	Silk: formic or sulphuric acid Nylon: formic or sulphuric acid + Na <sub>2</sub> SO <sub>4</sub> (occasionally)		DYEING: OTHER FIBRES
Direct on wool and silk	Direct and discharge on wool and silk		PRINTING
ISO 4 — — 5  4-5 5 6  3-4 — —  — 4-5 3 —  4-5 — 4-5 4 —	AATCC      ISO 3-4          4-5 5            4-5 —            3-4 —            — —            4-5  —            6 6            6-7 —            7  3            1-2 3            5 —            — —            —  —            2 —            — 3            5 —            3 —            3-4  3-4          4 —            — 5            5 3-4          2-3 3-4          5	ISO 4-5 4-5 — — 4  7-8 7-8 7-8  3-4 4 —  —  — 4-5 — —  4-5 4 4 4-5 4-5	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ - $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Dischargeable to white Slight change Little or no change Slight change	Good Redder — Duller	Good — — —	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
See Leather Dyes Section	Anodised aluminium		NON-TEXTILE USAGE
			NOTES

# C.I. Acid Yellow 103—108

C.I. Acid Yellow	103	104	105
CHEMICAL CLASS	Monoazo (metallised)	Azo (metallised)	Disazo
C.I. CONSTITUTION NUMBER	—	—	20281
HUE Daylight Artificial light (tungsten)	Greenish yellow Redder	Yellow Redder	
DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres	3  Good; can be salted — Acetate and cellulose— <i>u</i>	3  Good — Acetate and cellulose— <i>u</i>	
DYEING: OTHER FIBRES	Silk: acid	Silk: formic acid. Levelling: good Fastness properties similar to those on wool	
PRINTING		Direct on wool and silk	
FASTNESS PROPERTIES Method	AATCC	ISO	ISO
Alkali	—	4	4-5
Carbonising	5	4	5
Chlorination — alteration	—	2-3	5
staining wool	—	—	—
Decatising	4	4-5	4
Light, $\frac{1}{2}$ — $\frac{1}{4}$ normal	—	5-6	6
normal	5-6	6	6-7
2 × normal	—	6-7	7
Milling, alkaline — alteration	3	—	2-3
staining wool	—	—	—
Milling, acid — alteration	—	4	4
staining wool	—	3-4	—
Peroxide bleaching — alteration	—	2	4-5
staining wool	—	4-5	—
Perspiration	2-3	4	5
Potting — alteration	—	3	4
staining wool	—	2	—
Sea water — alteration	3	4-5	5
staining wool	3	3	—
Stoving	5	5	5
Washing — alteration	4-5	4	4-5
staining wool	4-5	5	5
OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron	Good Moderate change — Considerable change	Very good Duller and weaker — Duller and weaker	
NON-TEXTILE USAGE		See Leather Dyes section	See Leather Dyes section
NOTES			Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—crimson



# C.I. Acid Yellow 109—113

C.I. Acid Yellow	109	110	111
CHEMICAL CLASS	—	—	—
C.I. CONSTITUTION NUMBER	—	—	—
HUE Daylight Artificial light (tungsten)		Yellow Little changed	Yellow Redder
DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres	This C.I. Generic Name is discontinued. The dyes formerly listed under it now appear under C.I. Acid Yellow 56	2, 3  Good — Acetate and cellulose—u	1, 2  Moderate — Cotton—ss, acetate and viscose—u
DYEING: OTHER FIBRES		Silk: acetic acid or neutral. Fastness properties similar to those on wool	Silk: broken degumming liquor or Glauber's salt and ammonium sulphate or acetate Nylon: as wool
PRINTING		Direct on wool, silk and viscose	Direct on wool, silk, nylon and viscose
FASTNESS PROPERTIES Method		AATCC      ISO	ISO
Alkali		—	5
Carbonising		4-5	4-5
Chlorination — alteration		—	5
staining wool		—	4-5
Decatising		5	5
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal		—	4-5
normal		4	5
2 × normal		—	6
Milling, alkaline — alteration		—	5
staining wool		—	4-5
Milling, acid — alteration		—	—
staining wool		—	—
Peroxide bleaching — alteration		—	5
staining wool		—	—
Perspiration		4-5	5
Potting — alteration		—	—
staining wool		—	—
Sea water — alteration		3-4	4-5
staining wool		—	5
Stoving		—	5
Washing — alteration		5	5
staining wool		5	4-5
OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron		Dischargeable to white Unchanged Little or no change Little duller	Poor (wool), moderate to good (nylon) — Little change —
NON-TEXTILE USAGE			See Leather Dyes section
NOTES			



112	113	C.I. Acid Yellow
— —	Monoazo (metallised) —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Reddish yellow Redder and duller	Dull reddish yellow Redder and brighter	HUE Daylight Artificial light (tungsten)
1, 2  Moderate — Acetate and cellulose—u	1, 2  Fair — —	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Silk: broken degumming liquor or Glauber's salt and ammonium sulphate or acetate Nylon: as wool	Nylon: ammonium acetate Fastness properties tend to be better than on wool	DYEING: OTHER FIBRES
Direct on wool, silk, nylon and viscose Vigoureux printing	Direct on wool and nylon	PRINTING
ISO  5 4-5 4-5 — 5  6 7 7-8  4-5 5 — —  — — 5 — —  5 4-5 5 4-5 4-5	AATCC Wool                      Nylon —                      — —                      — —                      — —                      — —                      —  —                      — 6                      7-8 —                      —  4                      2 —                      — —                      — —                      —  —                      3 —                      — 4-5                      5 —                      — —                      —  4                      5 —                      — —                      — 3-4                      4 —                      —	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Good — Little change —	Moderate (nylon) Much greener and duller — Much redder and duller	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
See Leather Dyes section	See Leather Dyes section	NON-TEXTILE USAGE
	Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—yellow	NOTES

# C.I. Acid Yellow 114—117

C.I. Acid Yellow	114	115
CHEMICAL CLASS	Azo (metallised)	Disazo
C.I. CONSTITUTION NUMBER	—	—
HUE Daylight Artificial light (tungsten)	Reddish yellow Somewhat redder	Yellow Slightly redder
DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres	1, 2  Initial strike level; migration poor — Acetate and cellulose— <i>vss</i>	1, 2  Poor — Acetate and cellulose— <i>u</i>
DYEING: OTHER FIBRES	Silk: neutral or weakly acid. Levelling: good Fastness properties similar to those on wool Nylon: neutral or slightly alkaline	Silk: acetic acid or neutral Nylon: acetic or formic acid
PRINTING	Direct on wool, silk and viscose	Direct on wool and silk
FASTNESS PROPERTIES Method	ISO	AATCC
Alkali	4-5	4
Carbonising	4-5	5
Chlorination — alteration	4	—
staining wool	—	—
Decatising	5	—
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	6	—
normal	6-7	4
2 × normal	7	—
Milling, alkaline — alteration	4-5	1
staining wool	5	—
Milling, acid — alteration	4-5	—
staining wool	3	—
Peroxide bleaching — alteration	5	3
staining wool	—	—
Perspiration	5	5
Potting — alteration	3-4	—
staining wool	—	—
Sea water — alteration	5	5
staining wool	—	—
Stoving	5	5
Washing — alteration	5	3-4
staining wool	5	—
OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron	Dischargeable to white (wool and silk) Unchanged — Rather duller	Good Slightly redder and duller — Very much duller
NON-TEXTILE USAGE	See Leather Dyes section	See Leather Dyes section
NOTES		Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—orange

116	116:1	117	C.I. Acid Yellow
— —	— —	Disazo 24820	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Reddish yellow Slightly redder	Reddish yellow —	Yellow Little change	HUE Daylight Artificial light (tungsten)
1, 2 Initial strike level; migration poor — Acetate—s, cellulose—ss	Slightly different chemically from C.I. Acid Yellow 116, but similar in hue, usage and properties	1, 2 Good; not suitable for salting — Acetate and cellulose—ss	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Silk: neutral or slightly acid Fastness properties similar to those on wool. Nylon: neutral; exhaust with am- monium acetate		Silk: acetic or formic acid or neutral. Levelling: good Fastness properties rather lower than on wool	DYEING: OTHER FIBRES
Direct on wool, silk and nylon Vigoureux printing		Direct on wool, silk, nylon and viscose	PRINTING
ISO  5 5 4-5 — 4-5  6 6-7 7  5 — 5 —  — — 5 — —  — — 5 5 5		ISO  5 4 — — 4-5  3 4 4-5  4 — 5 —  4-5 — 4-5 — —  4-5 — 4-5 4-5 4-5	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Moderate — — —		Good Greener and duller Little change Little change	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
See Leather Dyes section		See Leather Dyes section	NON-TEXTILE USAGE
			NOTES

# C.I. Acid Yellow 118—122

C.I. Acid Yellow	118	119
<b>CHEMICAL CLASS</b>	—	—
<b>C.I. CONSTITUTION NUMBER</b>	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Reddish yellow Slightly duller	Reddish yellow Slightly duller
<b>DYEING: WOOL</b> Method	—	—
Levelling	—	—
S.D.C. migration test method/grade	—	—
Staining other fibres	Silk and wool— <i>hs</i> , cellulose— <i>vss</i>	Silk and wool— <i>hs</i> , cellulose— <i>vss</i>
<b>DYEING: OTHER FIBRES</b>	Nylon: Perlon and nylon 66, ammonia and a levelling agent; exhaust with ammonium sulphate. Good rinsing is essential Levelling: very good	Nylon: Perlon and nylon 66, ammonia and a levelling agent; exhaust with ammonium sulphate. Good rinsing is essential Levelling: good
<b>PRINTING</b>	Direct on nylon	Direct on nylon
<b>FASTNESS PROPERTIES</b> Method	ISO	Wool ISO Nylon 6
Alkali	5	5 5
Carbonising	5	5 —
Chlorination — alteration	4-5	4-5 4-5
staining wool	—	—
Decatising	4-5	5 4 (redder, duller)
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal	7	6 6
normal	7-8	6 7
2 × normal	7-8	7 7-8
Milling, alkaline — alteration	5	4-5 4-5
staining wool	4-5	4-5 4-5
Milling, acid — alteration	4-5	5 —
staining wool	4	5 —
Peroxide bleaching — alteration	2-3	4 —
staining wool	—	—
Perspiration	5	5 4-5
Potting — alteration	3	3-4 —
staining wool	2	3 —
Sea water — alteration	5	5 4-5
staining wool	4-5	5 5
Stoving	5	5 —
Washing — alteration	5	4-5 4-5
staining wool	5	5 4-5
<b>OTHER PROPERTIES</b> Dischargeability	Very good	Good to very good
Effect of metals — copper	Unchanged	Unchanged
chromium	—	—
iron	Unchanged	Unchanged
<b>NON-TEXTILE USAGE</b>		
<b>NOTES</b>		



<b>120</b>	<b>121</b>	<b>122</b>	<b>C.I. Acid Yellow</b>
Monoazo (metal complex) <b>14007</b>	Monoazo (metal complex) <b>18690</b>	Monoazo <b>19110</b>	<b>CHEMICAL CLASS</b> <b>C.I. CONSTITUTION NUMBER</b>
Yellow —	Reddish yellow —	Yellow —	<b>HUE</b> Daylight Artificial light (tungsten)
1, 2	1, 2  Initial strike level; migration poor Acetate— <i>ss</i> , cotton— <i>vss</i>	1  Good — —	<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres
	Silk: neutral or acetic acid Nylon: neutral to slightly alkaline		<b>DYEING: OTHER FIBRES</b>
	Direct on wool, silk and nylon		<b>PRINTING</b>
	AATCC                  ISO  5                      4 5                      4-5 —                     4-5 —                     — 5                      4  6                      6 6-7                  6-7 7                      7  4-5                  4-5 5                      — —                     — —                     —  —                     — —                     — 5                      5 —                     — —                     —  5                      5 4                      — —                      4 5                      4-5 5                      —	ISO  — — — — —  — 5-6 —  2-3 — — —  — — 4 — — —  — — — 2 —	<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool  Decatising  Light, $\frac{1}{3}$ - $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
	Very good Affected Much affected Slightly affected		<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron
	See Leather Dyes section		<b>NON-TEXTILE USAGE</b>
			<b>NOTES</b>

# C.I. Acid Yellow 123—128

C.I. Acid Yellow	123	124	125
<b>CHEMICAL CLASS</b>	Monoazo (1:2 metal complex)	Monoazo (metal complex)	—
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Yellow Unchanged	Bright reddish yellow Redder	
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	1, 2  Initial strike level; migration poor — Acetate— <i>ss</i> , cellulose— <i>vss</i>	1, 2  Moderate; not suitable for salting — Acetate, acrylic and polyester— <i>u</i> , cellulose— <i>hs</i>	This C.I. Generic Name is discon- tinued
<b>DYEING: OTHER FIBRES</b>	Silk: slightly acid Nylon: neutral or slightly alkaline bath; ammonium acetate added for exhaustion	Silk: neutral or slightly acid, levelling: moderate Nylon: neutral or slightly acid	
<b>PRINTING</b>	Direct on wool, silk and nylon	Direct on wool, silk and nylon	
<b>FASTNESS PROPERTIES</b> Method	ISO	AATCC	
Alkali	4-5	5	
Carbonising	5	5	
Chlorination — alteration	5	—	
staining wool	5	—	
Decatising	5	—	
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal	6-7	6-7	
normal	7	7	
2 × normal	7-8	8	
Milling, alkaline — alteration	4-5	4	
staining wool	4-5	4	
Milling, acid — alteration	4-5	—	
staining wool	3	—	
Peroxide bleaching — alteration	—	3-4	
staining wool	—	3-4	
Perspiration	5	5	
Potting — alteration	2	—	
staining wool	2	—	
Sea water — alteration	5	5	
staining wool	5	5	
Stoving	4-5	—	
Washing — alteration	4-5	4	
staining wool	5	2-3	
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron		Very good Slightly duller Little change Slightly greener and duller	
<b>NON-TEXTILE USAGE</b>			
<b>NOTES</b>		Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—greenish yellow	

126	127	128	C.I. Acid Yellow
— —	Monoazo —	Monoazo (1:2 metal complex) —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Dull greenish yellow —	Bright greenish yellow —	Greenish yellow —	HUE Daylight Artificial light (tungsten)
	1, 2 Migration poor* Acetate and cellulose—u	1, 2 Good; can be salted — Acetate and cellulose—ss	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
	Silk and nylon: ammonium sulphate or acetate	Silk: neutral or weakly acid bath	DYEING: OTHER FIBRES
	Nylon: direct and discharge		PRINTING
	<div style="display: flex; justify-content: space-around;"> <div> <p>ISO</p> <p>Wool</p> <p>4 (redder)</p> <p>5</p> <p>2-3</p> <p>—</p> <p>5</p> <p>5</p> <p>6</p> <p>6-7</p> <p>4-5</p> <p>4-5</p> <p>5</p> <p>4-5</p> <p>4-5</p> <p>4-5</p> <p>5</p> <p>3-4</p> <p>2-3</p> <p>5</p> <p>5</p> <p>4-5</p> <p>4 (redder)</p> <p>5</p> </div> <div> <p>Nylon</p> <p>—</p> <p>—</p> <p>—</p> <p>—</p> <p>—</p> <p>5</p> <p>5</p> <p>6</p> <p>—</p> <p>—</p> <p>—</p> <p>—</p> <p>—</p> <p>—</p> <p>5</p> <p>—</p> <p>—</p> <p>4-5</p> <p>5</p> </div> </div>	<div style="display: flex; justify-content: space-around;"> <div> <p>ISO</p> <p>5</p> <p>5</p> <p>4 (redder)</p> <p>—</p> <p>4-5</p> <p>6-7</p> <p>7</p> <p>7-8</p> <p>4</p> <p>4-5</p> <p>4-5</p> <p>4</p> <p>4-5</p> <p>4</p> <p>4-5</p> <p>4</p> <p>4-5</p> <p>2</p> <p>2</p> <p>5</p> <p>5</p> <p>5</p> <p>4-5</p> <p>4-5</p> </div> </div>	<p>FASTNESS PROPERTIES</p> <p>Method</p> <p>Alkali</p> <p>Carbonising</p> <p>Chlorination — alteration staining wool</p> <p>Decatising</p> <p>Light, <math>\frac{1}{2}</math>—<math>\frac{1}{2}</math> normal normal 2 × normal</p> <p>Milling, alkaline — alteration staining wool</p> <p>Milling, acid — alteration staining wool</p> <p>Peroxide bleaching — alteration staining wool</p> <p>Perspiration</p> <p>Potting — alteration staining wool</p> <p>Sea water — alteration staining wool</p> <p>Stoving</p> <p>Washing — alteration staining wool</p>
	4 — — —	5 — Little change —	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
See Leather Dyes section	See Leather Dyes section	See Leather Dyes section	NON-TEXTILE USAGE
	*But exhausts slowly and evenly		NOTES

### C.I. Acid Yellow 129—134

C.I. Acid Yellow	129	130	131
CHEMICAL CLASS	Monoazo (1:2 metal complex)	Monoazo (metal complex)	Monoazo
C.I. CONSTITUTION NUMBER	—	—	—
HUE Daylight Artificial light (tungsten)	Yellow Slightly redder	Dull greenish yellow —	Bright yellow Somewhat redder
DYEING: WOOL Method	1, 2	1, 2	1, 2
Levelling S.D.C. migration test method/grade Staining other fibres	Good — Acetate, cellulose, acrylic and polyester—ss	— — —	Good; can be salted — Acetate and cotton—u
DYEING: OTHER FIBRES	Silk and nylon: neutral or weakly acid Acrilan: acetic acid, exhaust with sulphuric acid		Silk: neutral or acetic acid Nylon: neutral or weakly acid
PRINTING	Wool, silk and nylon: direct and discharge		Direct on wool, silk and nylon Dischargeable grounds
FASTNESS PROPERTIES Method	ISO		ISO
Alkali	4-5		4
Carbonising	4-5		4
Chlorination — alteration	4		3-4
staining wool	—		—
Decatising	5		4
Light, $\frac{1}{8}$ - $\frac{1}{2}$ normal	6-7		5-6
normal	7		6
2 × normal	7-8		6-7
Milling, alkaline — alteration	4		4
staining wool	5		5
Milling, acid — alteration	4		4-5
staining wool	3		4-5
Peroxide bleaching — alteration	4-5		4-5
staining wool	3		4-5
Perspiration	5		5
Potting — alteration	3		3-4
staining wool	2		3
Sea water — alteration	5		5
staining wool	4-5		5
Stoving	—		5
Washing — alteration	5		4
staining wool	5		5
OTHER PROPERTIES			
Dischargeability	4-5		5
Effect of metals — copper	4		4
chromium	Little change		Little change
iron	3		3
NON-TEXTILE USAGE	See Leather Dyes section		See Leather Dyes section
NOTES	Fastness on silk: Light 6-7; Perspiration, Sea water and Washing 4-5 Fastness on nylon: Light 7; Alk. milling and washing 4-5; Perspiration and Sea water 5 Fastness on Acrilan: Light 7; Alk. milling 5, 4-5; Perspiration 5; Washing 4-5, 5		Fastness on silk: Light 6-7; Perspiration 5; Washing 5 Fastness on nylon: Light 6; Alk. milling 5, 5; Perspiration 5; Sea water 5; Washing 5



132	133	134	C.I. Acid Yellow
Disazo —	Azo (metal complex) —	Monoazo (1:2 metal complex) 11650	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Reddish yellow→orange —	Yellow —	Reddish yellow —	HUE Daylight Artificial light (tungsten)
3 Good; can be salted Acetate and cellulose—u	1, 2 — — —	1, 2 Poor; initial strike level Acetate—vss, cellulose—ss	DYEING: WOOL Method Levelling S.D.C. migration test method/grade Staining other fibres
Silk: formic or acetic acid Nylon: formic acid		Nylon: neutral	DYEING: OTHER FIBRES
Direct and discharge styles on wool and silk		Direct on wool, silk and nylon Vigoureux printing	PRINTING
ISO 4-5 3-4 3 2-3 4  2-3 3 4  1-2 4-5 3 2-3  3-4 3 3 3 2  4-5 1 2-3 2 3		ISO 5 4 4 4 5  6 6-7 7  4-5 3 4-5 3-4  3-4 3-4 5 — —  — — 4-5 1-2 3-4	FASTNESS PROPERTIES Method Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Good Greener and slightly duller — Weaker		Not dischargeable 4 — 3-4	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
See Leather Dyes section Pigments: as alkaline earth metal salts Paper Soap Shoe polishes Wood stains		See Leather Dyes section	NON-TEXTILE USAGE
Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—violet, on diln magenta red			NOTES

# C.I. Acid Yellow 135—140

C.I. Acid Yellow	135	136	137
<b>CHEMICAL CLASS</b>	Azo	Monoazo	Monoazo (1:2 metal complex)
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Bright greenish yellow Redder	Yellow —	Yellow Little redder
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres			1, 2  — — —
<b>DYEING: OTHER FIBRES</b>	Nylon: neutral or acetic acid Acetate: neutral Acrylic: cuprous ion Cotton and polyester—s		Nylon: ammonium sulphate and sodium phosphate Silk, jute, sisal
<b>PRINTING</b>	Direct on nylon		Direct on wool, silk and nylon
<b>FASTNESS PROPERTIES</b> Method	Direct ISO Aftertreated*		ISO
Alkali	5	5	4-5
Carbonising	—	—	4-5
Chlorination — alteration	5	5	4-5
staining wool	5	5	4-5
Decatising	5	5	—
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal	6	6	6-7
normal	7	7	7
2 × normal	7	7	7-8
Milling, alkaline — alteration	5	4	4-5
staining wool	4-5	5	4-5
Milling, acid — alteration	—	—	4-5
staining wool	—	—	2-3
Peroxide bleaching — alteration	—	—	4
staining wool	—	—	3-4
Perspiration	5	5	5
Potting — alteration	2	4	1-2
staining wool	2	2	2
Sea water — alteration	—	—	5
staining wool	—	—	5
Stoving	—	—	4-5
Washing — alteration	3	5	4-5
staining wool	4	5	4-5
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Dischargeable to white Redder, duller — Unaffected		4 3-4 — 3-4
<b>NON-TEXTILE USAGE</b>		Anodised aluminium: Fastness—Light 8	See Leather Dyes section
<b>NOTES</b>	*With formic and tannic acids		

138	139	140	C.I. Acid Yellow
Monoazo (1:2 metal complex) —	Monoazo (1:2 metal complex) —	Monoazo (1:2 metal complex) —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Yellow Greener	Yellow Redder	Reddish yellow Slightly redder	HUE Daylight Artificial light (tungsten)
1, 2 — — —	1, 2 — — —	1, 2 Migration poor* — Acetate— <i>hs</i> , cellulose— <i>ss</i>	DYEING: WOOL Method Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: ammonium sulphate and sodium phosphate Silk, jute and sisal	Nylon: ammonium sulphate and sodium phosphate Silk, jute, sisal	Silk: neutral or slightly acid Nylon: slightly alkaline	DYEING: OTHER FIBRES
Direct on wool, silk and nylon	Direct on wool, silk and nylon		PRINTING
ISO 4-5 4-5 4-5 4-5 4-5 6 6-7 7 4-5 4-5 4-5 4 4-5 4 5 2 2 5 5 4-5 4-5 4-5	ISO 4-5 4-5 4-5 4-5 4-5 6 6-7 7 4-5 4-5 4-5 3 4-5 3-4 5 2 2 5 5 4-5 4-5 4-5	ISO 4 4-5 — — 3 6 6-7 7 4 5 — — 4 4 4 2-3 2-3 4 4-5 4-5 4-5 5	FASTNESS PROPERTIES Method Alkali Carbonising Chlorination — alteration staining wool Decatising Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool Sea water — alteration staining wool Stoving Washing — alteration staining wool
3 3-4 — 4-5	3-4 4 — 3-4	Good — Little effect —	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
See Leather Dyes section	See Leather Dyes section		NON-TEXTILE USAGE
		Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—yellow, on diln orange  *Initial strike level	NOTES

**C.I. Acid Yellow 141—146**

<b>C.I. Acid Yellow</b>	<b>141</b>	<b>142</b>	<b>143</b>
<b>CHEMICAL CLASS</b>	Disazo	Disazo	Monoazo
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Bright yellow —	Bright greenish yellow Redder	Yellow Slightly redder
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	1, 2  Good; unsuitable for salting — Acetate and viscose— <i>u</i> , cotton— <i>ss</i>	1, 2  Moderate; unsuitable for salting — Acetate and cellulose— <i>u</i>	3  Good; can be salted — Viscose— <i>u</i> , acetate and cotton— <i>ss</i>
<b>DYEING: OTHER FIBRES</b>		Silk: neutral or slightly acid	
<b>PRINTING</b>	Direct on wool, silk and nylon	Direct on wool, silk, cotton and viscose	Direct on wool, silk and nylon
<b>FASTNESS PROPERTIES</b> Method	ISO	ISO	ISO
Alkali	4	4	4-5
Carbonising	4	4-5	5
Chlorination — alteration	4	4	4-5
staining wool	4-5	4-5	4-5
Decatising	5	4	4-5
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal	4-5	4-5	5
normal	5	5	5-6
2 × normal	5	5	6
Milling, alkaline — alteration	3-4	4	2
staining wool	4	4	3-4
Milling, acid — alteration	4	4-5	3-4
staining wool	4	4-5	3
Peroxide bleaching — alteration	3 (redder)	4-5	3
staining wool	4	4-5	3-4
Perspiration	4-5	5	4
Potting — alteration	3-4	4	2
staining wool	3	3-4	2
Sea water — alteration	4-5	5	4
staining wool	5	5	4-5
Stoving	5	4	5
Washing — alteration	3-4	4	2
staining wool	4	4-5	4
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	4 3 (duller) — 3-4 (duller)	4 2-3 Little effect 3 (redder, duller)	4 3 (redder) — 4-5
<b>NON-TEXTILE USAGE</b>			
<b>NOTES</b>	<b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—yellowish orange; on diln—yellow	<b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—reddish orange; on diln—yellow	<b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—greenish yellow



144	145	146	C.I. Acid Yellow
Monoazo	Monoazo	Monoazo	CHEMICAL CLASS
—	—	—	C.I. CONSTITUTION NUMBER
Bright greenish yellow Slightly redder	Yellow Unchanged	Bright greenish yellow Unchanged	HUE Daylight Artificial light (tungsten)
2	3	3	DYEING: WOOL Method
Good; can be salted — Acetate and cotton— <i>u</i>	Good; can be salted — Acetate— <i>ss</i> , cellulose— <i>u</i>	Good; can be salted — Acetate and cellulose— <i>u</i>	Levelling S.D.C. migration test method/grade Staining other fibres
			DYEING: OTHER FIBRES
Direct on wool, silk and nylon			PRINTING
ISO	ISO	ISO	FASTNESS PROPERTIES Method
4	4 (redder)	3-4 (redder)	Alkali
5	4	4 (redder)	Carbonising
4-5	3 (duller)	3	Chlorination — alteration
4-5	4	4	staining wool
4-5	4	4-5	Decatising
5-6	4	3	Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal
6-7	5	4-5	normal
7	5-6	5	2 × normal
1	1	1	Milling, alkaline — alteration
3-4	1	3-4	staining wool
4	2-3	2	Milling, acid — alteration
3-4	1	1	staining wool
2	2	2-3	Peroxide bleaching — alteration
3-4	2	3-4	staining wool
4-5	3-4	3-4	Perspiration
3	2	2-3	Potting — alteration
2-3	2	2	staining wool
4	3	3-4	Sea water — alteration
3-4	2-3	2-3	staining wool
5	3-4	2	Stoving
1	1	1	Washing — alteration
4	3	3-4	staining wool
	4 3 (duller) Little effect 4 (duller)	Very good 2 (redder, duller) — 3-4 (duller)	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
			NON-TEXTILE USAGE
Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—reddish orange	Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—reddish orange	Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—greenish yellow	NOTES

### C.I. Acid Yellow 147—153

C.I. Acid Yellow	147-148	149	150
<b>CHEMICAL CLASS</b>	—	Monoazo	Monoazo (1 : 2 metal complex)
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)		Bright yellow Little redder	Reddish yellow Little redder
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres		1  Good Acetate and cellulose— <i>u</i>	1, 2  Migration poor, but dyeing uniform Acetate and cellulose— <i>s</i> polyester— <i>ss</i>
<b>DYEING: OTHER FIBRES</b>	These C.I. Generic Names are discontinued	Nylon: disodium phosphate	Silk and nylon: faintly alkaline (ammonia). Acetic acid for exhaustion
<b>PRINTING</b>		Direct on wool, silk, acetate and nylon	Direct on wool, silk and nylon
<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ – $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool		ISO*  4 3 — — 4  4-5 5-6 6  5 4-5 4-5 4-5  — — 5 3 —  5 5 4 5 4-5	ISO*  5 4 4-5 — 5  6 7 7-8  4-5 5 3 4-5  3 5 5 3 3  5 5 5 5 4-5
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron		Dischargeable to white Slightly duller — Little redder and duller	Moderate 4-5 — 3
<b>NON-TEXTILE USAGE</b>			
<b>NOTES</b>		*Fastness on nylon: Light 3, 4-5, 5; Washing 5	*Fastness on silk: Light 6-7, 7, 7; Washing 4-5 Fastness on nylon: Light 6, 6-7, 7; Washing 4-5

151	152	153	C.I. Acid Yellow
Azo (metal complex) —	Azo (metal complex) —	Monoazo 19230	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Bright yellow Slightly redder and brighter	Reddish yellow Redder	Bright greenish yellow —	HUE Daylight Artificial light (tungsten)
1, 2  Good — Acetate and cellulose—u	1, 2  Poor — Acetate—ss, cellulose—u		DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Silk: ammonium acetate	Silk: ammonium acetate Levelling: poor		DYEING: OTHER FIBRES
Direct on wool, silk and nylon	Direct on wool, silk and nylon		PRINTING
AATCC — 2* 2-3 — — — — — — — — 5 4-5 5 2-3 2  5 — 2-3 5 3	AATCC — 4-5 — — —  5-6 5-6 5-6  — — — — — — 3 (alk) 3-4 (acid) 4 —  5 — 1 4-5		FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
	Very good — — —		OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
		Surface dyeing of paper and manufacture of pig- ments for use in wallpaper and fancy papers	NON-TEXTILE USAGE
Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—yellow *After neutralising 4	Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—yellow		NOTES

### C.I. Acid Yellow 154—159

C.I. Acid Yellow	154	155	156
<b>CHEMICAL CLASS</b>	—	Monoazo (1:2 metal complex)	Monoazo (1:2 metal complex)
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)		Reddish yellow Redder	Dull reddish yellow Redder
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres		1, 2  Good in neutral bath — Viscose— <i>ss</i> , acetate, cotton, acrylic and polyester— <i>u</i>	1, 2  — Acetate and cellulose— <i>ss</i>
<b>DYEING: OTHER FIBRES</b>	This C.I. Generic Name is discontinued. The dyes formerly listed under it now appear under C.I. Acid Yellow 131	Silk and nylon	Silk: broken soap bath containing ammonium acetate; add acetic acid for exhaustion Nylon: neutral
<b>PRINTING</b>			Direct on wool Vigoureux printing
<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool  Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool  Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool  Perspiration Potting — alteration staining wool  Sea water — alteration staining wool  Stoving Washing — alteration staining wool		ISO  4 4-5 4-5 5 —  6-7 7-8 7-8  4-5 5 4-5 3-4  4-5 4 5 2-3 2-3  5 4-5 5 4-5 5	ISO  4 — 4-5 4-5 4  6 6-7 7  4 4 4 4  3-4 4 4-5 2-3 2-3  4-5 4-5 4 4-5 4-5
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron		4 3-4 (duller) 4-5 4-5	3 4 4 4
<b>NON-TEXTILE USAGE</b>			
<b>NOTES</b>			Solubility: 60 g/l



157	158	159	C.I. Acid Yellow
1:2 metal complex —	Azo —	Disazo —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Reddish yellow Redder	Greenish yellow Redder	Bright reddish yellow Redder, brighter	HUE Daylight Artificial light (tungsten)
1, 2 — — Acetate and cellulose— <i>u</i>	1, 2 Good — —	— — —	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Silk: broken soap bath containing ammonium acetate Nylon: as wool		Nylon: ammonium sulphate. Barré nylon covered Staining of acetate 3-4; acrylic 5; cotton 3-4; viscose 4-5	DYEING: OTHER FIBRES
Direct on wool Vigoureux printing			PRINTING
ISO 5 5 5 5 5  6 6-7 7  5 5 5 5  5 5 5 2-3 1  5 5 5 5 5	ISO 3-4 (redder) 4-5 5 5 4 (redder)  5 6 6-7  4-5 5 4-5 5  4 5 4-5 4 4  4-5 5 4 4 (redder) 5	AATCC — — — — —  5-6 6-7 7  — — — —  — — 5 (acid) 5 (alk) — —  5 — — 5 5	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
3 3-4 4 4	Good — — —		OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
			NON-TEXTILE USAGE
Solubility: 30 g/l	Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—greenish yellow	Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—deep bright blue; on diln—turbid yellow	NOTES

**C.I. Acid Yellow 160—165**

<b>C.I. Acid Yellow</b>	<b>160</b>	<b>161</b>	<b>162</b>
<b>CHEMICAL CLASS</b>	Monoazo (1:2 metal complex)	Azo (metallised)	Azo (metallised)
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Reddish yellow Redder	Yellow Redder	Yellow Slightly redder
<b>DYEING: WOOL</b> Method	1, 2	1, 2	1, 2
Levelling — S.D.C. migration test method/grade Staining other fibres	Good — Acrylic, cellulose, polyester and triacetate— <i>u</i> , silk— <i>hs</i>	Good — Acetate, cellulose, acrylic and polyester— <i>u</i>	Moderate to good — Acetate and cellulose— <i>ss-s</i> , acrylic— <i>hs</i> , silk— <i>d</i>
<b>DYEING: OTHER FIBRES</b>	Nylon: neutral at 100°C or 115–120°C; levelling: good Good solidity on wool-nylon mixtures	Silk: neutral or weakly acid Nylon: careful temperature control required; ammonium acetate improves exhaustion	Nylon: neutral; exhaust with ammonium acetate or sulphate
<b>PRINTING</b>		Direct on wool, silk and nylon Vigoureux printing	
<b>FASTNESS PROPERTIES</b> Method	ISO		ISO
	Wool	Nylon	
Alkali	5	5	5
Carbonising	4–5	—	—
Chlorination — alteration	4	1	—
staining wool	—	—	—
Decatising	4–5	5	—
Light, $\frac{1}{3}$ – $\frac{1}{2}$ normal	6	6	—
normal	6–7	6–7	7–8
2 × normal	7	7	—
Milling, alkaline — alteration	4–5	5	4–5
staining wool	5	5	4–5
Milling, acid — alteration	4–5	5	—
staining wool	4–5	5	—
Peroxide bleaching — alteration	4–5	—	5
staining wool	5	—	4
Perspiration	5	5	5
Potting — alteration	2–3	—	4–5
staining wool	1	—	2
Sea water — alteration	5	—	5
staining wool	5	—	5
Stoving	4	5	—
Washing — alteration	4–5	5	4–5
staining wool	4–5	5	5
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Poor 3–4 (redder) 2–3 3–4 (redder)	4–5 — Little effect —	5 Unaffected — Affected
<b>NON-TEXTILE USAGE</b>			
<b>NOTES</b>	Solubility 50 g/l at 85°C		Solubility 30 g/l at 80°C

163	164	165	C.I. Acid Yellow
Azo (metallised) —	Azo —	Azo —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Reddish yellow Slightly redder	Yellow	Greenish yellow	HUE Daylight Artificial light (tungsten)
1, 2  Moderate to good — Cotton—ss, viscose—ss-s, acetate— —ss-u, acrylic—s, silk—d	Moderate		DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: neutral; exhaust with am- monium acetate or sulphate	Nylon Silk	Nylon	DYEING: OTHER FIBRES
			PRINTING
ISO  5 — — — —  7-8 —  4-5 4-5 — —  5 4 4-5 4-5 2  4-5 4-5 — 4-5 5			FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ - $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
5 Affected — Marked effect			OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
			NON-TEXTILE USAGE
Solubility 80 g/l at 80°C			NOTES

**C.I. Acid Yellow 166—171**

C.I. Acid Yellow	166	167	168
CHEMICAL CLASS	Disazo	Monoazo (metal complex)	Monoazo
C.I. CONSTITUTION NUMBER	—	—	—
HUE Daylight Artificial light (tungsten)	Yellow Redder	Greenish yellow —	Greenish yellow Redder
DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres	2  Good — Acetate, acrylic and polyester 5; cotton 4; viscose 4–5		
DYEING: OTHER FIBRES	Silk: acetic acid. Nylon: ammonium sulphate; good coverage of barré nylon Suitable for some acrylic fibres, e.g. Acrilan		Nylon: good coverage of irregular yarn* Backtanning slightly improves wet-fastness
PRINTING	Direct on wool		
FASTNESS PROPERTIES Method			ISO
Alkali	Wool 3–4	ISO Silk 4	5
Carbonising	4	—	5
Chlorination — alteration	3–4	—	5
staining wool	—	—	5
Decatising	4–5	—	5
Light, $\frac{1}{3}$ – $\frac{1}{2}$ normal	6	4	6–7
normal	6–7	5	7
2 × normal	7	6	7
Milling, alkaline — alteration	—	—	5
staining wool	—	—	5
Milling, acid — alteration	4–5	—	—
staining wool	4–5	—	—
Peroxide bleaching — alteration	—	—	5
staining wool	—	—	4–5
Perspiration	5	4–5	5
Potting — alteration	3–4	—	3
staining wool	2–3	—	3
Sea water — alteration	4–5	4–5	5
staining wool	5	5	5
Stoving	—	—	5
Washing — alteration	3–4	2	5 (ISO 3)
staining wool	4	4–5	5
OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron	Good 2 (redder, duller) Duller 4		Dischargeable — — —
NON-TEXTILE USAGE		Anodised aluminium Light fastness 8; Weathering fastness very good	
NOTES	Solubility 100 g/l at 90°C		*Staining other fibres: cotton 4–5, acetate 4, polyester and viscose 5, wool and silk 1



169	170	171	C.I. Acid Yellow
Monoazo —	— —	— —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Yellow Redder			HUE Daylight Artificial light (tungsten)
3  Good — Acetate 4–5, cellulose 4, acrylic and polyester 5			DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: formic acid. Levelling: good Triacetate: solvent swelling processes	This C.I. Generic Name is discontinued. The dyes formerly listed under it now appear under C.I. Acid Yellow 160	This C.I. Generic Name is discontinued. The dyes formerly listed under it now appear under C.I. Acid Yellow 129	DYEING: OTHER FIBRES
Direct on wool, silk and nylon			PRINTING
ISO Wool                  Nylon 3–4                  3 —                  — —                  3–4 —                  — —                  —  6                  5–6 6–7              6 7                  6–7  —                  — —                  — —                  — —                  —  —                  — —                  — 5                  4 —                  — —                  —  5                  4 4                  3–4 —                  — 3 (No.2, 50°C)    2–3 (60°C) 4                  —			FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ – $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Good 3–4 (duller) — 3–4 (duller)			OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
			NON-TEXTILE USAGE
			NOTES

### C.I. Acid Yellow 172—177

C.I. Acid Yellow	172	173	174
<b>CHEMICAL CLASS</b>	Monoazo	Monoazo (1:2 metal complex)	Monoazo
<b>C.I. CONSTITUTION NUMBER</b>	18969	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Yellow Slightly redder	Yellow Redder	Bright yellow —
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	2, 3  Good — Acetate 4, cellulose 5, polyester 4-5	1, 2  — — Acetate, acrylic, polyester 5, cotton 4-5, viscose 5	
<b>DYEING: OTHER FIBRES</b>	Nylon: acid Silk: acid or neutral + Glauber's salt	Silk: neutral or weakly acid Nylon: ammonium sulphate and trisodium phosphate	Nylon: neutral or slightly acid
<b>PRINTING</b>	Direct on silk and wool	Wool, silk and nylon	
<b>FASTNESS PROPERTIES</b> Method	ISO	ISO	AATCC
Alkali	—	4	—
Carbonising	5	4-5	—
Chlorination — alteration	4-5	5	—
staining wool	5	4-5	—
Decatising	5	4-5	—
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	6	6	(1%) 6
normal	6-7	6-7	(4%) 7
2× normal	7	7	—
Milling, alkaline — alteration	—	4	—
staining wool	—	4	—
Milling, acid — alteration	4-5	4-5	—
staining wool	3-4	3-4	—
Peroxide bleaching — alteration	4 (redder)	—	—
staining wool	3-4	—	—
Perspiration	5	5	4-5
Potting — alteration	—	4-5	—
staining wool	—	2-3	—
Sea water — alteration	5	4-5	4-5
staining wool	4-5	5	4-5
Stoving	4	5	—
Washing — alteration	4 (redder) (No.2)	4-5 (No.3)	4-5 (IIA)
staining wool	5	4-5	5
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Good — —	Good 4 Some effect 4-5	— Duller — Greener
<b>NON-TEXTILE USAGE</b>			
<b>NOTES</b>		Solubility 75 g/l at 100°C, 40 g/l at 80°C	<b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—greenish yellow

175	176	177	C.I. Acid Yellow
Disazo —	Azo (1:1 Cr complex) —	Azo (metal complex) —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Bright reddish yellow —	Yellow Redder, duller	Reddish yellow Redder	HUE Daylight Artificial light (tungsten)
	3  — — Cotton— <i>ss</i> , viscose and poly- ester— <i>u</i> , acrylic— <i>ss</i>		DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: neutral or slightly acid	Nylon	Nylon	DYEING: OTHER FIBRES
	Direct on wool and nylon		PRINTING
AATCC	ISO	ISO	FASTNESS PROPERTIES Method
—	Wool 4	—	Alkali
—	4	—	Carbonising
—	4	4	Chlorination — alteration
—	—	—	staining wool
—	4-5	4	Decatising
(1%) 7-8	—	—	Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal
(4%) 7-8	—	7-8	normal
—	—	—	2 × normal
—	4	—	Milling, alkaline — alteration
—	3-4	4-5	staining wool
—	—	—	Milling, acid — alteration
—	—	—	staining wool
—	3	3-4	Peroxide bleaching — alteration
—	4-5	5	staining wool
5	4-5	4	Perspiration
—	4	3-4	Potting — alteration
—	2-3	3	staining wool
5	4-5	4	Sea water — alteration
5	4-5	4	staining wool
—	4	4-5	Stoving
4 (IIA)	4	3-4	Washing — alteration
5	4-5	4-5	staining wool
—	Not dischargeable	—	OTHER PROPERTIES
Duller	—	5	Dischargeability
—	Duller	—	Effect of metals — copper
Redder	—	5	chromium
			iron
			NON-TEXTILE USAGE
Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—violet; on diln practically destroyed	Solubility—very good *Chlorinated water		NOTES

**C.I. Acid Yellow 178—182**

<b>C.I. Acid Yellow</b>	<b>178</b>	<b>179</b>	<b>180</b>
<b>CHEMICAL CLASS</b>	Monoazo	Azo (metal complex)	Monoazo
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Bright yellow —	Reddish yellow —	Bright yellow Brighter
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres			
<b>DYEING: OTHER FIBRES</b>	Nylon: acetic acid Staining other fibres: cotton, polyester and triacetate—u	Silk and nylon	Nylon: neutral or slightly acid. Good coverage of barré fibre
<b>PRINTING</b>			
<b>FASTNESS PROPERTIES</b> Method	ISO Nylon 6.6      Nylon 6	ISO Silk & Nylon	AATCC
Alkali	—	—	—
Carbonising	—	—	—
Chlorination — alteration staining wool	5*      4*	—	—
Decatising	—	—	—
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	6-7      6-7	—	—
normal	7      7	6-7	7-8
2 × normal	—	—	—
Milling, alkaline — alteration staining wool	—	—	—
Milling, acid — alteration staining wool	—	—	—
Peroxide bleaching — alteration staining wool	—	—	—
Perspiration	4-5	4	4-5
Potting — alteration staining wool	—	—	—
Sea water — alteration staining wool	4-5	4	—
Stoving	—	—	—
Washing — alteration staining wool	5	4-5	5 (40°C)
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	4 — — —		
<b>NON-TEXTILE USAGE</b>		See Leather Dyes section	
<b>NOTES</b>	*Chlorinated water	Solubility 30 g/l	<b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—dull yellow, on diln—dull yellow





### C.I. Acid Yellow 183—186

<b>C.I. Acid Yellow</b>	<b>183</b>	<b>184</b>
<b>CHEMICAL CLASS</b>	Disazo	—
<b>C.I. CONSTITUTION NUMBER</b>	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Reddish yellow Slightly redder, brighter	Brilliant greenish yellow Slightly redder
<b>DYEING: WOOL</b> Method	1, 2	1, 2
Levelling S.D.C. migration test method/grade Staining other fibres	Moderate — Cellulose— <i>ss</i> , acetate— <i>u</i>	Good — Cellulose and acetate— <i>u</i>
<b>DYEING: OTHER FIBRES</b>	Nylon: slightly acid	Nylon: acetic acid and sodium acetate
<b>PRINTING</b>	Direct on wool and nylon	Direct on wool and nylon
<b>FASTNESS PROPERTIES</b> Method	ISO Nylon 6.6	ISO Nylon 6.6
Alkali	—	—
Carbonising	—	—
Chlorination — alteration	—	—
staining wool	—	—
Decatising	—	—
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	—	—
normal	6	4
2 × normal	—	—
Milling, alkaline — alteration	—	—
staining wool	—	—
Milling, acid — alteration	—	—
staining wool	—	—
Peroxide bleaching — alteration	—	—
staining wool	—	—
Perspiration	4–5	4–5
Potting — alteration	—	—
staining wool	—	—
Sea water — alteration	—	—
staining wool	—	—
Stoving	—	—
Washing — alteration	4–5	4
staining wool	4–5	5
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Good — — —	Good — — —
<b>NON-TEXTILE USAGE</b>		
<b>NOTES</b>		

<b>185</b>	<b>186</b>	<b>C.I. Acid Yellow</b>
Monoazo (1:2 Cr complex) <b>14101</b>	Azo-Thiazole <b>13920</b>	<b>CHEMICAL CLASS</b> <b>C.I. CONSTITUTION NUMBER</b>
Yellow —	Bright greenish yellow Unchanged	<b>HUE</b> Daylight Artificial light (tungsten)
	2  — Acetate—s	<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres
	Silk: acetic or formic acid Nylon: dyed See C.I. Direct Yellow 8	<b>DYEING: OTHER FIBRES</b>
	Silk: urea-disodium phosphate	<b>PRINTING</b>
	ISO 4 4-5 4 — 5  2 3 4  4 3 4 3  5 — 4 — —  4 — — 4 —	<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ - $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
	Poor 1 — 4	<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron
See Leather Dyes section	Paper: limited usage in beater and coating Phenoplastic moulding powders	<b>NON-TEXTILE USAGE</b>
		<b>NOTES</b>

# C.I. Acid Yellow 187—193

C.I. Acid Yellow	187	188	189	190
CHEMICAL CLASS	Disazo	Disazo	Monoazo	Monoazo
C.I. CONSTITUTION NUMBER	—	—	—	—
HUE Daylight Artificial light (tungsten)	Reddish yellow —	Yellow —	Greenish yellow —	Yellow —
DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres				
DYEING: OTHER FIBRES				Nylon: acetic acid + special assistants
PRINTING				
FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool				ISO  — — 5* — 6-7 7 — — — — — 5 — 5 4 — 5 (60°C) 5
OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron				
NON-TEXTILE USAGE	See Leather Dyes section	See Leather Dyes section	See Leather Dyes section	
NOTES				*Chlorinated water



191	192	193	C.I. Acid Yellow
Disazo —	Monoazo —	Monoazo (metallised) —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Yellow Much redder	Bright yellow Much redder	Reddish yellow —	HUE Daylight Artificial light (tungsten)
1  Good 4-5 Cotton— <i>vss</i> , polyester— <i>us</i>	1  Good 5 Cotton— <i>vss</i> , polyester— <i>u</i>	1, 2  Good — Cellulose— <i>vss</i> , nylon— <i>hs</i> , polyester— <i>u</i> , silk— <i>hs</i>	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Silk: from an acetic acid bath; levelling—good	Silk: from an acetic acid bath; levelling—good		DYEING: OTHER FIBRES
Not suitable	Not suitable	Direct on nylon, silk and wool	PRINTING
ISO  4 4 3-4 4-5 4-5  4 4-5 5  — — 3-4 4-5  2 4 3-4 2-3 2  4 4 — 3-4 (No.1) 4-5	ISO  4 4 4 4-5 4-5  5 5-6 6  — — 3 1-2  1-2 4-5 3-4 2 1-2  4 3 — 3-4 (No.1) 4	JIS  5 — — — —  7 — 7-8  4-5 3 4-5 2-3  2-3 3-4 5 4 2  5 5 — 5 4-5	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ – $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Good — — —	Good — — —	Good — — —	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
			NON-TEXTILE USAGE
			NOTES

## NOTES

C.I. Acid Orange	1	1:1	2
<b>CHEMICAL CLASS</b>	Monoazo	Monoazo	
<b>C.I. CONSTITUTION NUMBER</b>	13090 or 13091	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Yellowish orange (on wool)* Redder	Yellowish orange Redder	Bright orange Little change
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	2, 3  — I/3-4 Acetate—s, cellulose—ss	Slightly different chemically from C.I. Acid Orange 1 but similar in properties and usage	3  Good — Cellulose and acetate—u
<b>DYEING: OTHER FIBRES</b>	Silk: acetic or sulphuric acid Nylon: ammonium sulphate		
<b>PRINTING</b>			
<b>FASTNESS PROPERTIES</b> Method	AATCC	ISO	AATCC
Alkali	3	4	—
Carbonising	4-5	3-4	4-5
Chlorination — alteration	—	4-5	4-5
staining wool	—	4	—
Decatising	5	4	4-5
Light, $\frac{1}{8}$ — $\frac{1}{2}$ normal	2	2	4
normal	3	3	4-5
2 × normal	4	4	5
Milling, alkaline — alteration	3-4	1	2-3
staining wool	3-4	1	—
Milling, acid — alteration	—	2	—
staining wool	—	1	—
Peroxide bleaching — alteration	3	1	—
staining wool	3	2	—
Perspiration	3-4	3	3
Potting — alteration	3	1	—
staining wool	3	1	—
Sea water — alteration	5	3	1-2
staining wool	5	2	—
Stoving	5	3	—
Washing — alteration	3-4	1	4
staining wool	3-4	2	—
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Moderate Slightly duller Unaffected Much duller		— Slight change — Slight change
<b>NON-TEXTILE USAGE</b>	Pigments as heavy metal salts See Leather Dyes section Soap		
<b>NOTES</b>	*Yellowish brown (on nylon)		<b>Reaction in Substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—orange

### C.I. Acid Orange 3—8

C.I. Acid Orange	3	4	5
<b>CHEMICAL CLASS</b>	Nitro	Disazo	Monoazo
<b>C.I. CONSTITUTION NUMBER</b>	10385	28690	13080
<b>HUE</b> Daylight Artificial light (tungsten)	Dull yellowish orange Much redder	Yellowish orange Little change	Yellowish orange Little change
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	3  Can be salted I/5 Cellulose and acetate— <i>u</i>	3  Good — Cellulose and acetate— <i>u</i>	1, 2, 3  Good — Cellulose and acetate— <i>ss</i>
<b>DYEING: OTHER FIBRES</b>	Nylon: formic acid Silk: broken degumming liquor	Silk: broken degumming liquor	Silk: formic or sulphuric acid or broken degumming liquor
<b>PRINTING</b>			
<b>FASTNESS PROPERTIES</b> Method	AATCC	ISO	ISO
Alkali	4-5	4	4
Carbonising	4-5	4-5	3-4
Chlorination — alteration	—	4-5	3
staining wool	—	4	—
Decatising	4	4-5	4
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	5	5	2
normal	5-6	5-6	3
2 × normal	6	6	3-4
Milling, alkaline — alteration	2	1	1-2
staining wool	2	1	—
Milling, acid — alteration	—	2	1
staining wool	—	1	—
Peroxide bleaching — alteration	1	1	1-2
staining wool	1	1	—
Perspiration	3	3	2
Potting — alteration	—	1	1
staining wool	—	1	—
Sea water — alteration	2-3	2	1-2
staining wool	2-3	3	—
Stoving	3-4	3	2
Washing — alteration	1-2	1	1-2
staining wool	1-2	2	—
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Fair Slightly greener — Duller	Poor Little duller — Duller	Moderate Duller — Much weaker
<b>NON-TEXTILE USAGE</b>	Limited use as a shading component in soaps and wood stains See Leather Dyes section		Indicator Paper Soap Straw and glue See Leather Dyes section
<b>NOTES</b>	*Fastness on nylon: Light 3-4, 4, 4; Perspiration† and Washing† 4 †Dyeings aftertreated with a syntan		



6	7	8	C.I. Acid Orange
Monoazo 14270	Monoazo 15510	Monoazo 15575	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Yellowish orange Redder, brighter	Bright reddish orange Little brighter	Bright reddish orange Slightly yellower	HUE Daylight Artificial light (tungsten)
3 Moderate to good — Cellulose and acetate—ss	2, 3 — I/5 Cellulose and acetate—ss	2, 3 — I/5 Cellulose and acetate—ss	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: acetic or formic acid Silk: broken degumming liquor or formic acid	Nylon: formic acid Silk: broken degumming liquor	Silk: broken degumming liquor Nylon: acetic or formic acid Jute: acid or neutral	DYEING: OTHER FIBRES
	Direct on wool, silk and nylon	Direct on wool and silk	PRINTING
AATCC      ISO	AATCC      ISO	AATCC      ISO	FASTNESS PROPERTIES Method
4 3 — —	3 3 3 4	3-4 5 — 5	4 4 2-3 4 4
3 3-4 4	4 4-5 5	4 5 6	3 4-5 3 4
1 — — —	1-2 — 3 —	1 1 — —	2 3 3 3
1 — 1 —	1-2 — 2 —	1 1 1 —	2 3 3 2-3 1
3 — 2 4 —	3 — 3-4 3 —	3 3 2 1-2 1-2	2 1 1 1 2
Good Duller — Greener, duller	Good Redder, duller — Weaker, duller	Moderate to good Slightly redder and duller — Redder and duller	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
Finish colouring Biological stain and indi- cator, pH range 12-14 See Leather Dyes section See C.I. Food Yellow 8	Biological stain and indi- cator. Heavy metal salts for paper coating, transparent pigments in tin printing, and in moulding powders. Paper See C.I. Pigment Orange 17 See Leather Dyes section	Heavy metal salts are used as pigments Paper in beater dyeing and occasionally in coat- ings See Leather Dyes section	NON-TEXTILE USAGE
			NOTES

# C.I. Acid Orange 9—14

C.I. Acid Orange	9	10	11
<b>CHEMICAL CLASS</b>	Monoazo	Monoazo	Xanthene
<b>C.I. CONSTITUTION NUMBER</b>	17925	16230	45370
<b>HUE</b> Daylight Artificial light (tungsten)	Reddish orange Redder	Bright orange Redder, brighter	Reddish orange —
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	3  Good — Cellulose and acetate—u	3  Can be salted at boil 1/4–5 Acetate and cellulose—u	Neutral or acetic acid — — —
<b>DYEING: OTHER FIBRES</b>		Silk: formic or sulphuric acid Levelling: good	Silk: neutral or acetic acid
<b>PRINTING</b>	Direct on wool	Direct on wool and silk	Direct on wool and silk
<b>FASTNESS PROPERTIES</b> Method	ISO	AATCC	ISO
Alkali	4	3	4–5
Carbonising	3–4	4	4
Chlorination — alteration	—	—	3
staining wool	—	—	4–5
Decatising	4	4	4
Light, $\frac{1}{2}$ – $\frac{1}{2}$ normal	5	3	4
normal	6	4	4–5
2 × normal	6	6	5
Milling, alkaline — alteration	2	1	1
staining wool	—	1	3
Milling, acid — alteration	2–3	—	3
staining wool	—	—	1
Peroxide bleaching — alteration	1–2	1	1
staining wool	—	1	5
Perspiration	—	2	2
Potting — alteration	—	—	2
staining wool	—	—	1
Sea water — alteration	2–3	1	2
staining wool	—	1	1
Stoving	—	3	2
Washing — alteration	3	1	1
staining wool	—	1	5
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron		Good Redder, duller — Almost destroyed	
<b>NON-TEXTILE USAGE</b>		Biological stain Paper, wood stains, inks and copying pencils See C.I. Food Orange 4 See Leather Dyes section	Paper, inks and lead pencils Pigments as heavy metal salts See C.I. Solvent Red 72
<b>NOTES</b>			

12	13	14	C.I. Acid Orange
Monoazo 15970	— —	Monoazo 16100	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Bright orange Little change	Bright reddish orange Redder	Bright reddish orange Unchanged	HUE Daylight Artificial light (tungsten)
2, 3  I/4-5 Cellulose and acetate—ss	3  Moderate — Cellulose and acetate—u	2, 3  I/3 Cellulose and acetate—ss	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Silk: acetic or formic acid or broken degumming liquor Jute:		Silk: acetic acid	DYEING: OTHER FIBRES
Direct on wool and silk		Direct on wool	PRINTING
AATCC      ISO	ISO	ISO	FASTNESS PROPERTIES Method
3-4      4	3	3	Alkali
4-5      3	4-5	4	Carbonising
—      2-3	2-3	4	Chlorination — alteration
—      3	—	4	staining wool
4      4	4	4-5	Decatising
3      3	2	3	Light, $\frac{1}{8}$ - $\frac{1}{2}$ normal
4      4	3	4	normal
5      4-5	3	4-5	2 × normal
1      1	1-2	1	Milling, alkaline — alteration
1      1	1-2	1	staining wool
—      2-3	—	3	Milling, acid — alteration
—      1	—	1	staining wool
—      1	—	1	Peroxide bleaching — alteration
—      2	—	3	staining wool
2      2-3	3	3-4	Perspiration
2      1	—	2	Potting — alteration
2      1	—	1	staining wool
4      2-3	3	3-4	Sea water — alteration
4      1	—	1	staining wool
4      2	2	3	Stoving
2-3      1	4	2	Washing — alteration
2-3      2	5	5	staining wool
Good Slightly duller — Much duller and weaker	Good — — —	Moderate to good Redder — Slightly redder	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
Paper, moulding powders, biological stain and indicator See Leather Dyes section See C.I. Food Orange 1 See C.I. Pigment Orange 18		Bright yellowish red alu- minium and barium salts for paper coating Paper and button dyeing	NON-TEXTILE USAGE
			NOTES

# C.I. Acid Orange 15—20

C.I. Acid Orange	15	16	17
<b>CHEMICAL CLASS</b>	Azine	Monoazo	Monoazo
<b>C.I. CONSTITUTION NUMBER</b>	50120	16011	16020
<b>HUE</b> Daylight Artificial light (tungsten)	Reddish orange Little change	Bright reddish orange Redder, brighter	Reddish orange Redder
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	3  Good; can be salted at boil — Cellulose— <i>ss</i> , acetate— <i>u</i>	1, 2, 3  Moderate — Cellulose— <i>s</i> , acetate— <i>u</i>	3  Moderate — Acetate— <i>ss</i> , cellulose— <i>u</i>
<b>DYEING: OTHER FIBRES</b>	Silk: formic or sulphuric acid	Silk: broken degumming liquor	Silk: from sulphuric acid dyebath Jute
<b>PRINTING</b>	Direct on wool and silk		
<b>FASTNESS PROPERTIES</b> Method	ISO	ISO	ISO
Alkali	3-4	3-4	4
Carbonising	4	4-5	4-5
Chlorination — alteration	—	4	—
staining wool	—	4-5	—
Decatising	4-5	3-4	4
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	2	3-4	2
normal	3	4	3-4
2 × normal	3	4-5	3-4
Milling, alkaline — alteration	2	—	2
staining wool	—	—	—
Milling, acid — alteration	—	1	—
staining wool	—	2	—
Peroxide bleaching — alteration	1	2	—
staining wool	—	2	—
Perspiration	2-3	4	2
Potting — alteration	1	2	2
staining wool	—	—	—
Sea water — alteration	2-3	4	1-2
staining wool	—	3	—
Stoving	3	4	4
Washing — alteration	1-2	3	2-3
staining wool	3	3	—
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Poor Browner — Browner	Good Little duller — Duller	Good — — —
<b>NON-TEXTILE USAGE</b>		Barium salt is a bright red-dish orange pigment used for paper coating and in printing inks	Pigments and paper dyeing
<b>NOTES</b>			



18	19	20	C.I. Acid Orange
Monoazo 16120	Monoazo 14690	Monoazo 14600	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Orange —	Reddish orange Yellower, brighter	Orange —	HUE Daylight Artificial light (tungsten)
From acid dyebath — — —	2, 3  I/3 Cellulose and acetate— <i>ss-u</i>	From acid dyebath — — —	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Silk: acid	Nylon: formic acid Silk: formic or sulphuric acid or broken degumming liquor	Silk: acid	DYEING: OTHER FIBRES
	Direct on wool and silk		PRINTING
	AATCC                      ISO 2-3                          4* 4                              3-4 —                              4 —                              4 5                              3  3                              4 4                              4-5 5                              5  2-3                          1 2-3                          3 —                              2 —                              1  1                              1 1                              2 2-3                          3 —                              1 —                              1  3                              3 3                              3 5                              2 2                              3 2                              2		FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
	Good Duller Unaffected Duller		OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
	See Leather Dyes section	Indicator See Leather Dyes section	NON-TEXTILE USAGE
	*Fastness on nylon: Light 3-4, 4, 4-5; Perspiration 5; Washing (3) 4		NOTES

**C.I. Acid Orange 20:1—24:1**

<b>C.I. Acid Orange</b>	<b>20:1</b>	<b>21</b>	<b>22</b>
<b>CHEMICAL CLASS</b>	Monoazo	—	Monoazo
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Orange —	Bright orange Unchanged	Bright reddish orange Much redder
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	Chemically slightly different from C.I. Acid Orange 20 but very similar in properties and uses	3  Good — Cellulose and acetate— <i>u</i>	3  — I/4-5 Cellulose and acetate— <i>u</i>
<b>DYEING: OTHER FIBRES</b>		Silk: formic or sulphuric acid	
<b>PRINTING</b>		Direct on wool and silk	Direct on wool
<b>FASTNESS PROPERTIES</b> Method		ISO	ISO
Alkali		4-5	4
Carbonising		—	4-5
Chlorination — alteration		—	4
staining wool		—	4
Decatising		4	4
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal		4	4
normal		4-5	4-5
2 × normal		5	5
Milling, alkaline — alteration		1-2	1
staining wool		3-4	1
Milling, acid — alteration		—	2-3
staining wool		—	1
Peroxide bleaching — alteration		—	1
staining wool		—	4
Perspiration		2	2-3
Potting — alteration		—	1
staining wool		—	1
Sea water — alteration		4	2
staining wool		3-4	1
Stoving		4	5
Washing — alteration		2	1
staining wool		3-4	5
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron		Moderate — Unaffected —	Moderate to good Duller — Little change
<b>NON-TEXTILE USAGE</b>			
<b>NOTES</b>			

23	24	24:1	C.I. Acid Orange
Monoazo 15540	Disazo 20170	Disazo —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Bright reddish orange Slightly yellower	Orange→Reddish orange Brighter	Orange→Reddish orange Brighter	HUE Daylight Artificial light (tungsten)
3 Good — Acetate—ss, cellulose—u	2, 3 Good — Cellulose and acetate—ss	Slightly different chemically from C.I. Orange 24 but properties and uses very similar	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Silk: broken degumming liquor	Nylon: acetic or formic acid Silk: acetic acid		DYEING: OTHER FIBRES
			PRINTING
ISO 1 4 — — 4-5  3-4 4 4  2-3 — — —  1 — 2-3 1 —  3 — 1 2-3 3	AATCC      ISO 1      1 5      4-5 —      3 —      — —      4-5  —      1-2 3      2-3 —      3-4  1      1-2 2      1 —      1 —      —  1      1 —      — 1      2 —      —  4      2-3 —      — 1      1-2 3      3 —      —	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool  Decatising  Light, ½–½ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool  Perspiration Potting — alteration staining wool  Sea water — alteration staining wool  Stoving Washing — alteration staining wool	
Poor Little duller — Duller and yellower	Poor Slightly duller — Very much duller		OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
Barium and calcium salts are orange pigments of moderate fastness to water See Leather Dyes section	Shoe creams Biological stain		NON-TEXTILE USAGE
			NOTES

### C.I. Acid Orange 25—29

C.I. Acid Orange	25	26	27
<b>CHEMICAL CLASS</b>	Disazo	Monoazo (metallised)	Monoazo
<b>C.I. CONSTITUTION NUMBER</b>	20160	—	17750
<b>HUE</b> Daylight Artificial light (tungsten)	Orange→Reddish orange Brighter	Orange —	Bright orange Slightly redder
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	2, 3  Good — Cellulose and acetate—ss	3  Good — Cellulose and acetate—u	3  Good; can be salted at boil — Cellulose and acetate—u
<b>DYEING: OTHER FIBRES</b>		Nylon: formic acid	Silk: broken degumming liquor
<b>PRINTING</b>		Direct on nylon	Direct on wool
<b>FASTNESS PROPERTIES</b> Method	ISO	AATCC	ISO
Alkali	1	4*	3-4
Carbonising	4-5	4	4-5
Chlorination — alteration	3	—	3-4
staining wool	—	—	4
Decatising	4-5	—	4
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	1-2	7	4-5
normal	2-3	7	5-6
2 × normal	3-4	8	6
Milling, alkaline — alteration	1-2	3	1-2
staining wool	1	—	—
Milling, acid — alteration	1	—	3-4
staining wool	—	—	3
Peroxide bleaching — alteration	1	1	1-2
staining wool	—	—	3
Perspiration	2	3-4	2-3
Potting — alteration	—	—	—
staining wool	—	—	—
Sea water — alteration	2-3	4	3
staining wool	—	—	3
Stoving	1-2	—	3-4
Washing — alteration	3	4	1-2
staining wool	—	—	3
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Poor Slightly duller — Very much duller	— Negligible — Negligible	Good Somewhat changed — Little duller
<b>NON-TEXTILE USAGE</b>	See Leather Dyes section	Spirit printing inks Anodised aluminium Soap See Leather Dyes section	Dip staining of paper
<b>NOTES</b>		*Fastness on nylon: Light 5, Alk. milling 3, Peroxide bleaching 1, Perspiration 2, Washing II 4-5	



28	28:1	29	C.I. Acid Orange
Monoazo 16240	Monoazo —	— —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Bright orange Little change	Bright orange Little change	Orange Little change	HUE Daylight Artificial light (tungsten)
3 — II/2 Cellulose and acetate—u	Slightly different chemically from C.I. Acid Orange 28 but very similar in proper- ties and uses	3 Good — Cellulose and acetate—u	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: acetic or formic acid Silk: broken degumming liquor		Silk: acetic or sulphuric acid	DYEING: OTHER FIBRES
Direct on wool, silk and nylon		Direct on wool and silk	PRINTING
AATCC 3-4 5 2-3 2-3 5 4-5 5-6 6 1-2 1-2 — — — — 1 — — 4-5 4-5 3-4 4 4	ISO 4 3 3 4-5 4-5 4 4-5 5 1 2 3 2 1 5 4-5 3 2 4 3 1 3-4 3	ISO 4 4-5 — — 5 4-5 5-6 6 — — 2 — 4-5 — 3-4 — — — 5 4 5	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Moderate to good Somewhat duller Unaffected Much duller		Good Little duller Unaffected Little duller	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
Casein See Leather Dyes section			NON-TEXTILE USAGE
			NOTES

**C.I. Acid Orange 30—35**

<b>C.I. Acid Orange</b>	<b>30</b>	<b>31</b>	<b>32</b>
<b>CHEMICAL CLASS</b>	Monoazo	Monoazo	Polyazo
<b>C.I. CONSTITUTION NUMBER</b>	17770	15995	—
<b>HUE</b> Daylight Artificial light (tungsten)	Bright orange Unchanged	Bright orange Little change	Bright reddish orange Yellower
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	3  Good; can be salted — Cellulose and acetate— <i>ss</i>	3  Good — Cellulose and acetate— <i>u</i>	
<b>DYEING: OTHER FIBRES</b>	Silk: acetic acid or broken degumming liquor	Nylon and silk: sulphuric acid	
<b>PRINTING</b>	Direct on wool and silk	Direct on wool and silk	Silk and tin-weighted silk
<b>FASTNESS PROPERTIES</b> Method	ISO	AATCC	AATCC Silk
Alkali	3-4	1	—
Carbonising	4-5	5	—
Chlorination — alteration	3-4	—	—
staining wool	—	—	—
Decatising	4-5	3	—
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	4	—	—
normal	5	6	6
2 × normal	5-6	—	—
Milling, alkaline — alteration	3	1	—
staining wool	—	—	—
Milling, acid — alteration	3-4	—	—
staining wool	—	—	—
Peroxide bleaching — alteration	2	—	—
staining wool	—	—	—
Perspiration	2-3	2	4
Potting — alteration	1-2	—	—
staining wool	—	—	—
Sea water — alteration	3	2-3	—
staining wool	—	—	—
Stoving	3-4	4	—
Washing — alteration	3	2	4-5
staining wool	3	—	—
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Good Little duller Unaffected Yellower and duller	Good Destroyed — Much weaker	
<b>NON-TEXTILE USAGE</b>		Barium salt is used as a pigment Paper in beater dyeing and surface colouring Casein plastics from a sulphuric acid dyebath See Leather Dyes section	
<b>NOTES</b>			Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—magenta

<b>33</b>	<b>34</b>	<b>35</b>	<b>C.I. Acid Orange</b>
Disazo 24780	Azo (metallised) —	Monoazo —	<b>CHEMICAL CLASS</b>  <b>C.I. CONSTITUTION NUMBER</b>
Reddish orange Very slightly yellower	Dull orange Yellower	Orange Redder	<b>HUE</b> Daylight Artificial light (tungsten)
1, 2  Moderate Cellulose and acetate— <i>vss</i>	3  Good Cellulose— <i>ss</i> , acetate— <i>u</i>	3  Good Cellulose and acetate— <i>u</i>	<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon Silk: weak acid or broken degumming liquor	Nylon: formic or sulphuric acid	Silk: acetic or sulphuric acid	<b>DYEING: OTHER FIBRES</b>
Direct on wool and silk		Direct on wool	<b>PRINTING</b>
ISO Wool      Nylon 4 — 4 — — — — — 4-5 —  3-4 4-5 4-5 5 5 5-6  3 — — — 4-5 — — —  3 — 3 5 — — — —  4 — — — 3-4 — 3-4 (3) 5 3-4 4	AATCC Wool      Nylon 4-5 — 4-5 — — — — — 4 —  — — 5 4-5 — —  5 2-3 — — — — — —  2 1 — — 5 4-5 — — — —  5 4 — — 5 — 4-5 3-4 — —	ISO 5 5 — — 5  3-4 4 4-5  3 — — —  — — 3-4 — — —  3-4 — 4-5 4 —	<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool  Decatising  Light, $\frac{1}{2}$ - $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Good Little duller — Somewhat duller	Poor Somewhat redder Unaffected Much redder	Good Duller — Much duller	<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron
Staining or colouring of creped tissue paper Straw, jute and sisal See Leather Dyes section	See Leather Dyes section	Paper	<b>NON-TEXTILE USAGE</b>
	<b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—yellow	<b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—reddish orange	<b>NOTES</b>

# C.I. Acid Orange 36—41

C.I. Acid Orange	36	37	38
CHEMICAL CLASS	Monoazo	Disazo	Disazo
C.I. CONSTITUTION NUMBER	—	—	—
HUE Daylight Artificial light (tungsten)	Bright orange Slightly yellower	Bright reddish orange (on wool)* —	Bright yellowish orange Redder
DYEING: WOOL Method	3	3	3
Levelling S.D.C. migration test method/grade Staining other fibres	Good; can be salted at boil — Cellulose—ss, acetate—u	Moderate — Cellulose—ss, acetate—u	Moderate — Cellulose and acetate—u
DYEING: OTHER FIBRES	Silk: acetic acid	Silk: Glauber's salt	Silk: formic acid
PRINTING		Direct on silk	
FASTNESS PROPERTIES Method	ISO	ISO Wool      Silk	ISO
Alkali	4	—	1
Carbonising	4-5	—	4-5
Chlorination — alteration	—	—	3
staining wool	—	—	—
Decatising	5	—	4-5
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	4-5	2-3	6
normal	5-6	3-4	6-7
2 × normal	6	4-5	7
Milling, alkaline — alteration	3-4	—	1
staining wool	—	—	—
Milling, acid — alteration	2-3	—	2-3
staining wool	—	—	—
Peroxide bleaching — alteration	1-2	—	1-2
staining wool	—	—	—
Perspiration	4-5	4-5	2-3
Potting — alteration	—	4-5	1
staining wool	—	—	—
Sea water — alteration	4	—	3-4
staining wool	—	—	—
Stoving	5	—	2-3
Washing — alteration	4	4	2-3
staining wool	4	—	3
OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron	Good Slightly duller Unaffected Duller	Good — — —	Poor Little duller — Unchanged
NON-TEXTILE USAGE			
NOTES		*Yellowish brown on silk	



39	40	41	C.I. Acid Orange
Azo (metallised) —	Azo —	Monoazo 16015	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Reddish orange Yellower and clearer	Reddish orange Little change	Orange Duller, redder	HUE Daylight Artificial light (tungsten)
1, 2  Good — —	2  Poor — Cellulose and acetate— <i>u</i>	1, 2  Moderate — Silk— <i>hs</i> , cellulose and acetate— <i>ss</i>	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: ammonium acetate Silk: neutral or acetic acid	Silk: neutral		DYEING: OTHER FIBRES
Direct on wool, silk and nylon Vigoureux printing	Direct on wool, silk and viscose		PRINTING
ISO 4-5 4-5 4-5 4-5 5  6 6-7 6-7  5 4-5 4-5 4  4-5 3-4 5 2 1-2  5 5 3-4 5 4-5	ISO 4-5 4 5 5 5  4 5 5-6  4 4-5 — —  4 4-5 4-5 3-4 1  5 5 5 4 4-5	ISO 2-3 4-5 4 4 —  3 4 4  — — 3 3  2 3-4 3-4 — —  3 4 3 3 4-5	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Good — — —	Moderate to good Very much duller — Duller	Good Duller — Much duller	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
	Anodised aluminium Straw, coir, jute, sisal		NON-TEXTILE USAGE
	Reactions in substance H <sub>2</sub> SO <sub>4</sub> conc.—bluish red		NOTES

**C.I. Acid Orange 42—47**

<b>C.I. Acid Orange</b>	<b>42</b>	<b>43</b>	<b>44</b>
<b>CHEMICAL CLASS</b>	—	—	Azo (metallised)
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Reddish orange Slightly yellower	Bright orange Slightly redder	
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	2  — IV/1 Cellulose and acetate—u	2  Moderate to good — Cellulose and acetate—u	
<b>DYEING: OTHER FIBRES</b>	Nylon and silk: neutral or acetic acid	Nylon: weak acid	
<b>PRINTING</b>	Direct on wool, silk, nylon and viscose		
<b>FASTNESS PROPERTIES</b> Method	AATCC	ISO	ISO Wool      Nylon
Alkali	3-4	3-4	4      —
Carbonising	4-5	4	5      —
Chlorination — alteration	4-5	4	4      —
staining wool	4-5	5	—      —
Decatising	4-5	4-5	—      5
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	2	3	4-5      5
normal	2-3	3	5      6
2 × normal	3	4	5-6      6-7
Milling, alkaline — alteration	3	3-4	—      —
staining wool	3	4	—      —
Milling, acid — alteration	—	3-4	—      —
staining wool	—	4	—      —
Peroxide bleaching — alteration	—	5	2      —
staining wool	—	3	—      —
Perspiration	4-5	5	4      5
Potting — alteration	—	2-3	—      —
staining wool	—	1	—      —
Sea water — alteration	5	5	4-5      5
staining wool	5	5	—      5
Stoving	4-5	2	4-5      —
Washing — alteration	4-5	4-5	4-5      5
staining wool	4-5	5	5      5
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Moderate to good Duller Unaffected Slightly duller	Excellent on nylon — Unaffected —	
<b>NON-TEXTILE USAGE</b>		See Leather Dyes section	Leather: vegetable, chrome and semi-chrome tannages; brush staining
<b>NOTES</b>			

45	46	47	C.I. Acid Orange
Disazo 22195	— —	— —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Reddish orange Slightly yellower	Yellowish orange Little change	Reddish orange Slightly redder	HUE Daylight Artificial light (tungsten)
2 — IV/1 Cellulose and acetate—ss	1, 2 Good — Cellulose and acetate—ss	2 — IV/3-4 Cellulose and acetate—ss	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon and silk: neutral or acetic acid	Silk: neutral or acetic acid	Nylon: acetic acid Silk: neutral, acetic acid or broken degumming liquor	DYEING: OTHER FIBRES
Direct on wool, silk, nylon and viscose	Direct on wool and silk	Direct on wool and silk	PRINTING
AATCC      ISO	AATCC      ISO	AATCC      ISO	FASTNESS PROPERTIES Method
5 3 — — 4-5	4-5 3-4 4 5 4	5 3 — — 4	4-5 2 4 4-5 4
— 4-5 —	4 4 4-5	— 4-5 5	4 4-5 5
4 4 — —	4 4 1 4	— — 4 —	2 4 2-3 1
5 5 4-5 — —	5 4-5 4-5 2 1	— — 3-4 —	3 2 4-5 1 1
5 5 5 3-4 3-4	4-5 4-5 4-5 4-5 4-5	2 — — 4 4	4 4-5 2 2-3 3
— Little change Unaffected Duller	Moderate to good Little duller Unaffected Much duller	Good Little change Unaffected Duller	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
Heavy metal salts are used as pigments See Leather Dyes section		See Leather Dyes section	NON-TEXTILE USAGE
			NOTES

**C.I. Acid Orange 48—53**

C.I. Acid Orange	48	49	50	
CHEMICAL CLASS	Azo	Disazo	Monoazo	
C.I. CONSTITUTION NUMBER	—	23260	13150	
HUE Daylight Artificial light (tungsten)	Yellowish orange Redder	Reddish orange Little change	Bright reddish orange Little redder	
DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres	1, 2  Moderate — Acetate—s, cellulose—ss	1, 2  Moderate — Cellulose and acetate—ss	1, 2  Good — Cellulose and acetate—ss	
DYEING: OTHER FIBRES	Silk: neutral or acetic acid	Nylon and silk: neutral or acetic acid	Nylon and silk: neutral or acetic acid	
PRINTING	Direct on wool and silk	Direct on wool, silk and viscose	Direct on wool and silk	
FASTNESS PROPERTIES Method	ISO	AATCC	ISO	AATCC
Alkali	4-5	4-5	5	4
Carbonising	4	4	4-5	4
Chlorination — alteration	—	—	4	—
staining wool	—	—	—	—
Decatising	5	4-5	5	5
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal	4	4	4	—
normal	4-5	4-5	4-5	5
2 × normal	4-5	5	5	—
Milling, alkaline — alteration	4	3	4	2
staining wool	—	3	4	—
Milling, acid — alteration	—	—	4-5	—
staining wool	—	—	—	—
Peroxide bleaching — alteration	—	5	4-5	—
staining wool	—	—	—	—
Perspiration	4	4-5	4-5	4
Potting — alteration	—	—	—	—
staining wool	—	—	—	—
Sea water — alteration	4-5	5	4-5	4
staining wool	—	—	—	—
Stoving	4-5	4	4	4-5
Washing — alteration	4-5	4-5	4	4
staining wool	—	4-5	5	—
OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron	Poor Unchanged Unchanged Unchanged	Good; darkens on exposure Little duller Unchanged Duller	Good Little duller — Yellower and duller	
NON-TEXTILE USAGE	See Leather Dyes section	See Leather Dyes section	Casein plastics from a neutral, acetic or sulphuric acid dyebath Paper—in the beater and for coating and surface colouring See Leather Dyes section	
NOTES	Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—yellow; on diln—pink			



51	52	53	C.I. Acid Orange
Disazo 26550	Azo 13025	Azo —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Dull reddish orange (wool)* Little change	Orange —	Yellowish orange —	HUE Daylight Artificial light (tungsten)
1, 2 — IV/1 Cellulose and acetate— <i>ss</i>		2, 3  Moderate — Cellulose and acetate— <i>ss</i>	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: neutral, acetic or formic acid Silk: neutral or acetic acid	Silk: acid	Silk: acid	DYEING: OTHER FIBRES
Direct on wool, silk, nylon and viscose			PRINTING
AATCC 2 3 — —  3 4 5  3 3 — —  4 4 4 — —  4-5 4-5 4 3 3	ISO 4† 3-4 4 5 3  5 6 6-7  3-4 4-5 4 4-5  4 4-5 5 2 2  4-5 5 3-4 4-5 4-5	ISO 2 4 3 — 4  4-5 5 6  3 — —  — — 4 — —  4 — 4-5 4 —	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Moderate Slightly yellower Unchanged Duller		Moderate Unchanged — Little duller	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
Paper pulp Phenol-formaldehyde cast- ing resins Soap See Leather Dyes section	Indicator, pH 2.9 (red)—4.6 (yellow)		NON-TEXTILE USAGE
*Reddish brown (nylon) †Fastness on nylon: Light 4-5, 5, 6; Perspiration 5; Washing 4-5, 5		Reactions in substance H <sub>2</sub> SO <sub>4</sub> conc.—reddish orange	NOTES

**C.I. Acid Orange 53:1—58**

<b>C.I. Acid Orange</b>	<b>53:1</b>	<b>54</b>	<b>55</b>
<b>CHEMICAL CLASS</b>	Azo	Disazo	Disazo
<b>C.I. CONSTITUTION NUMBER</b>	—	—	24765
<b>HUE</b> Daylight Artificial light (tungsten)	Somewhat redder than C.I. Acid Orange 53	Reddish orange Yellower	Reddish orange Little change
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	This dye is C.I. Acid Orange 53 mixed with another (unlisted) dye	2  Moderate — Cellulose—ss, acetate —u	2  Moderate — Cellulose and acetate —u
<b>DYEING: OTHER FIBRES</b>		Nylon: ammonium chloride and acetic acid	Silk: neutral or broken degumming liquor
<b>PRINTING</b>			Direct on wool
<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool		AATCC  3 4-5 — — —  3 3-4 4  4 — —  2 — 3-4 — —  4 — 2 3 —	ISO  3 4-5 — — 4-5  3 3 4  3 — 4 —  3 — 2-3 — —  3-4 — 4 4 3
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron		— Much duller — Much duller	Good Little duller — Little duller
<b>NON-TEXTILE USAGE</b>			Paper
<b>NOTES</b>		Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—red	

56	57	58	C.I. Acid Orange
Disazo 22895	— —	— —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Reddish orange Slightly yellower, brighter	Dull reddish orange Little change	Bright reddish orange —	HUE Daylight Artificial light (tungsten)
1, 2 Moderate — Cellulose and acetate— <i>u</i>	1, 2 Good — Acetate— <i>s</i> , cellulose— <i>ss</i>	1, 2 Poor — —	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: formic acid Silk: acetic acid or broken degumming liquor	Silk: neutral or acetic acid	Silk: neutral or acetic acid	DYEING: OTHER FIBRES
Direct on wool and silk	Direct on wool, silk, nylon and viscose		PRINTING
AATCC                  ISO	AATCC                  ISO	ISO	FASTNESS PROPERTIES Method
3-4                  4	—                  2-3	—	Alkali
4                  4	4                  4	—	Carbonising
1                  —	—                  5	—	Chlorination — alteration
—                  —	—                  —	—	staining wool
4-5                  4-5	—                  —	—	Decatising
3                  2	—                  5	—	Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal
4                  3	6                  6	1	normal
5                  4	—                  6-7	—	2 × normal
4                  3	—                  4-5	—	Milling, alkaline — alteration
—                  —	—                  —	—	staining wool
3                  4	—                  4	—	Milling, acid — alteration
—                  —	—                  —	—	staining wool
1                  2	—                  —	—	Peroxide bleaching — alteration
—                  —	—                  —	—	staining wool
3                  4	5                  5	—	Perspiration
—                  —	—                  —	—	Potting — alteration
—                  —	—                  —	—	staining wool
3-4                  4-5	5                  4	—	Sea water — alteration
3-4                  4-5	—                  —	—	staining wool
3-4                  3	—                  5	—	Stoving
3-4                  4	3-4                  3-4	—	Washing — alteration
3-4                  3-4	3-4                  5	—	staining wool
Good Duller Unchanged Much duller	Moderate to good Duller Unchanged Much duller	— — — —	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
Paper coating and surface colouring See Leather Dyes section		Paper Pigments	NON-TEXTILE USAGE
			NOTES

### C.I. Acid Orange 59—63

C.I. Acid Orange	59	60	61
CHEMICAL CLASS	Disazo	Monoazo (metallised)	Monoazo (metallised)
C.I. CONSTITUTION NUMBER	—	—	19320
HUE Daylight Artificial light (tungsten)	Reddish orange —	Dull reddish orange Brighter	Orange Redder
DYEING: WOOL Method	2	1	3
Levelling S.D.C. migration test method/grade Staining other fibres	Moderate — Cellulose— <i>s</i> , acetate— <i>u</i> , nylon— <i>d</i>	Moderate — Cellulose and acetate— <i>u</i> , nylon— <i>d</i>	Moderate — Silk— <i>d</i> , cellulose and acetate— <i>u</i>
DYEING: OTHER FIBRES			Nylon: formic or sulphuric acid
PRINTING	Direct on wool, silk and nylon	Direct on wool and nylon	
FASTNESS PROPERTIES Method	AATCC	AATCC Wool Nylon	AATCC
Alkali	4-5	—	4
Carbonising	4	—	5
Chlorination — alteration	—	—	—
staining wool	—	—	—
Decatising	—	—	5
Light, $\frac{1}{8}$ — $\frac{1}{2}$ normal	3	—	5
normal	4	6-7	5-6
2 × normal	4	—	6
Milling, alkaline — alteration	3	3	4
staining wool	—	—	—
Milling, acid — alteration	—	—	—
staining wool	—	—	—
Peroxide bleaching — alteration	4	—	3
staining wool	—	—	—
Perspiration	4	5	4
Potting — alteration	—	—	—
staining wool	—	—	—
Sea water — alteration	4	3	4
staining wool	—	—	—
Stoving	4-5	—	—
Washing — alteration	3	4	3-4
staining wool	—	—	4
OTHER PROPERTIES			
Dischargeability	Moderate	Poor (on nylon)	Moderate
Effect of metals — copper	Redder	Redder and weaker	Duller
chromium	—	—	—
iron	Duller, yellower	Much yellower	Duller
NON-TEXTILE USAGE			See Leather Dyes section
NOTES	Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—dull red	Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—yellow	



62	62:1	63	C.I. Acid Orange
Monoazo (metallised) —	Monoazo (metallised)	Azo 22870	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Orange Little yellower and duller		Orange Little change	HUE Daylight Artificial light (tungsten)
3 Good; can be salted at boil — Cellulose and acetate— <i>u</i>	Chemically slightly different from C.I. Acid Orange 62 but similar in properties and uses	1, 2 Moderate — Cellulose and acetate— <i>ss</i>	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Silk: acid		Nylon: ammonium acetate Silk: neutral or acetic acid	DYEING: OTHER FIBRES
Direct on wool, silk and nylon		Direct on wool, silk, nylon and viscose	PRINTING
AATCC                  ISO 4                          3 4                          4 —                          4 —                          — —                          —  7                          6-7 7                          7 8                          7  4                          2-3 —                          5 —                          4-5 —                          3  2                          4 —                          — 4                          4 —                          3 —                          —  2-3                      3-4 —                          — 4-5                      4-5 4                          3-4 4                          4-5		AATCC                  ISO Nylon                  Wool —                          2 —                          4-5 4-5 (Pool water)      4 —                          — —                          5  —                          4-5 4-5                      5 —                          5-6  —                          3 —                          4-5 —                          5 —                          —  —                          — —                          — 4                          4 —                          — —                          —  —                          4-5 —                          — —                          4-5 4                          4 —                          5	FASTNESS PROPERTIES Method Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Moderate to good Duller — Duller		Good Unaffected Unaffected Slightly duller	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
See Leather Dyes section			NON-TEXTILE USAGE
Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—greenish yellow			NOTES

**C.I. Acid Orange 64—69**

<b>C.I. Acid Orange</b>	<b>64</b>	<b>65</b>	<b>66</b>
<b>CHEMICAL CLASS</b>	Monoazo (metallised)	—	—
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Dull yellowish orange Redder, brighter	Yellowish orange Brighter, redder	Yellowish red —
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	1, 2  Moderate — Silk—s, acetate—ss, cellulose—u	2  Moderate — Silk—s, cellulose and acetate—u	
<b>DYEING: OTHER FIBRES</b>	Nylon: ammonium acetate		Silk
<b>PRINTING</b>	Direct on wool and nylon		
<b>FASTNESS PROPERTIES</b> Method	AATCC		ISO
	Wool	Nylon	
Alkali	—	—	2
Carbonising	—	—	4
Chlorination — alteration	—	—	3-4
staining wool	—	—	—
Decatising	—	—	3
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	—	—	5
normal	6-7	7-8	5-6
2 × normal	—	—	6-7
Milling, alkaline — alteration	2-3	3	2
staining wool	—	—	3
Milling, acid — alteration	—	—	—
staining wool	—	—	—
Peroxide bleaching — alteration	—	3	—
staining wool	—	—	—
Perspiration	4-5	5	4-5
Potting — alteration	—	—	—
staining wool	—	—	—
Sea water — alteration	4	5	5
staining wool	—	—	—
Stoving	—	—	3-4
Washing — alteration	3-4	4	4
staining wool	—	—	5
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	— Unchanged — Unchanged	Poor — Unaffected —	
<b>NON-TEXTILE USAGE</b>	See Leather Dyes section	See Leather Dyes section	See Leather Dyes section
<b>NOTES</b>	<b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—yellow		

67	68	69	C.I. Acid Orange
— —	Monoazo (metallised) —	Azo (metallised)*	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Orange Redder	— —	Dull orange —	HUE Daylight Artificial light (tungsten)
1, 2  Moderate to good — Acetate— <i>ss</i> , cellulose— <i>u</i>	3  Good; can be salted at boil — Silk— <i>hs</i> , cellulose and acetate— <i>u</i>		DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Silk: neutral or acetic acid			DYEING: OTHER FIBRES
Direct on wool and silk			PRINTING
AATCC  — 4-5 — — —  — 4-5 —  — — — —  — 5 — —  5 — 5 5	ISO  3-4 5 5 5  4-5 5-6 6  — — 3-4 —  5 5 — —  4 5 4 5	ISO  3 4 4 — 5  6 7 7  2 — 4 —  4 — 4-5 3 —  3-4 — 4-5 4 4-5	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Good Little duller Unaffected Little duller	— Much duller Unaffected Much duller		OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
		See Leather Dyes section	NON-TEXTILE USAGE
		Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—yellow  *USP 2120799	NOTES

**C.I. Acid Orange 70—75**

<b>C.I. Acid Orange</b>	<b>70</b>	<b>71</b>	<b>72</b>
<b>CHEMICAL CLASS</b>	—	Azo (metallised)	Monoazo (metallised)
<b>C.I. CONSTITUTION NUMBER</b>	—	—	<b>18740</b>
<b>HUE</b> Daylight Artificial light (tungsten)	— —	Orange Yellower	Reddish orange Yellower, brighter
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres		3  Good — Silk and nylon— <i>hs</i> , cotton — <i>ss</i> , acetate and viscose— <i>u</i>	3  Good; can be salted at boil — Cellulose and acetate— <i>ss</i>
<b>DYEING: OTHER FIBRES</b>			Nylon: formic acid Silk: broken degumming liquor
<b>PRINTING</b>			Direct on wool and silk
<b>FASTNESS PROPERTIES</b> Method		ISO	AATCC      ISO
Alkali		5	3      3-4
Carbonising		4	4-5      4
Chlorination — alteration staining wool		— —	—      4
Decatising		4-5	4      4
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal		7	5      5-6
normal		7-8	6      6-7
2 × normal		7-8	7      7
Milling, alkaline — alteration staining wool		4 3-4	3-4      3
Milling, acid — alteration staining wool		— —	—      4
Peroxide bleaching — alteration staining wool		— —	2-3      3
Perspiration		5	2-3      3
Potting — alteration staining wool		— —	—      2-3
Sea water — alteration staining wool		5 4	3-4      4
Stoving		4-5	3-4      4
Washing — alteration staining wool		4-5 5	3      4
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron		Moderate — — —	Good Duller Unaffected Slightly redder, duller
<b>NON-TEXTILE USAGE</b>	See Leather Dyes section		See Leather Dyes section
<b>NOTES</b>			



<b>73</b>	<b>74</b>	<b>75</b>	<b>C.I. Acid Orange</b>
— —	Monoazo (metallised) <b>18745</b>	Monoazo (metallised) —	<b>CHEMICAL CLASS</b> <b>C.I. CONSTITUTION NUMBER</b>
— —	Orange Little change	Orange Redder	<b>HUE</b> Daylight Artificial light (tungsten)
	3  Good — Cellulose and acetate—ss	3  Good — Cellulose and acetate—u	<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres
	Nylon: formic acid Silk: formic acid or sulphuric acid	Silk: sulphuric acid dyebath	<b>DYEING: OTHER FIBRES</b>
	Direct on wool and silk	Direct on wool	<b>PRINTING</b>
	AATCC                  ISO  5                      4-5 5                      4-5 —                     4 —                     — 5                      4-5  5                      6 5                      6-7 6                      7  3-4                    4 —                     — —                     4 —                     —  4                      4 —                     — 5                      4 —                     3 —                     —  4                      4 —                     — 5                      4 3-4                    4 3-4                    4	ISO  4-5 5 — — —  6-7 7 7  4 — — —  — 4 — —  4-5 — 4-5 4 —	<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ - $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
	Moderate to good Duller, redder — Weaker, duller	— — — —	<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron
Leather: vegetable, chrome and semi-chrome tannages	Anodised aluminium See Leather Dyes section See C.I. Solvent Orange 5		<b>NON-TEXTILE USAGE</b>
		<b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—yellow	<b>NOTES</b>

**C.I. Acid Orange 76—82**

<b>C.I. Acid Orange</b>	<b>76</b>	<b>77 and 78</b>	<b>79</b>
<b>CHEMICAL CLASS</b>	Monoazo (metallised)	—	Disazo
<b>C.I. CONSTITUTION NUMBER</b>	<b>18870</b>	—	<b>23255</b>
<b>HUE</b> Daylight Artificial light (tungsten)	Dull reddish orange Little change		Reddish orange Slightly yellower
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	3  Good — Cellulose and acetate— <i>vss</i>		1, 2  Poor to moderate — Cellulose and acetate— <i>u</i>
<b>DYEING: OTHER FIBRES</b>	Nylon: formic acid Silk: sulphuric acid or broken degumming liquor		Silk: neutral or acetic acid or broken degumming liquor
<b>PRINTING</b>	Direct on wool and silk		Direct on wool and silk
<b>FASTNESS PROPERTIES</b> Method	AATCC	ISO	ISO
Alkali	5	4-5	4-5
Carbonising	3	5	4-5
Chlorination — alteration	—	4	—
staining wool	—	—	—
Decatising	5	5	4-5
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal	6	6-7	3-4
normal	7	7	4
2 × normal	8	7	4-5
Milling, alkaline — alteration	3	3	3-4
staining wool	3	1-2	—
Milling, acid — alteration	—	4	4-5
staining wool	—	4	—
Peroxide bleaching — alteration	4	—	2-3
staining wool	—	—	—
Perspiration	4	5	3-4
Potting — alteration	—	3	—
staining wool	—	2	—
Sea water — alteration	5	5	4-5
staining wool	—	—	—
Stoving	5	5	3-4
Washing — alteration	4	4	3-4
staining wool	4	4-5	3-4
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Good Weaker — Weaker		Poor Little duller Unaffected Duller
<b>NON-TEXTILE USAGE</b>	Amino plastics Barium salt is used as a pigment See Leather Dyes section Undiluted form is a solvent dye	See Leather Dyes section	
<b>NOTES</b>			

80	81	82	C.I. Acid Orange
— —	— —	— —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Dull yellowish orange Redder		Reddish orange Slightly yellower	HUE Daylight Artificial light (tungsten)
1  Moderate — Cellulose and acetate—ss		1, 2  Moderate — Cotton and acetate—ss, viscose—u	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: neutral Silk: neutral dyebath or broken degumming liquor		Nylon: neutral or weakly acid Silk: neutral or broken de- gumming liquor	DYEING: OTHER FIBRES
Direct on wool, silk and nylon		Direct on wool, silk, nylon and viscose	PRINTING
ISO Wool      Nylon 5          5 4          5 4-5       5 —         — 5          5  6-7       7 7         7-8 7-8       8  5          5 5          5 3-4       — 2-3       —  4-5       — 4-5       — 5          5 2-3       — —         —  5          5 —         — 4          5 5          5 5          5		ISO Wool      Nylon 5          5 4-5       4-5 4-5       4-5 —         — 5          5  6-7       6 7         7 7-8       7-8  4-5       5 5          5 —         — —         —  —         — —         — 5          5 —         — —         —  5          5 —         — 4-5       4-5 4-5       5 4-5       5	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Moderate Somewhat duller Unchanged Much duller		Good — Unaffected —	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
See Leather Dyes section	See Leather Dyes section	See Leather Dyes section	NON-TEXTILE USAGE
			NOTES

**C.I. Acid Orange 83—88**

<b>C.I. Acid Orange</b>	<b>83</b>	<b>84</b>	<b>85</b>
<b>CHEMICAL CLASS</b>	Disazo	—	—
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Reddish orange Redder	Reddish orange —	Dull yellowish orange Yellower
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	2  Poor — Cellulose—ss, acetate—u		1, 2  Poor; initial strike level — Cotton and acetate—ss, viscose—u
<b>DYEING: OTHER FIBRES</b>	Silk: neutral or acetic acid		Nylon: neutral or slightly alkaline Silk: neutral or slightly acid
<b>PRINTING</b>	Direct on wool, silk and viscose		Direct on wool, silk, nylon and viscose Vigoureux printing
<b>FASTNESS PROPERTIES</b> Method	ISO	—	ISO
Alkali	4-5	—	4-5
Carbonising	5	—	5
Chlorination — alteration	—	—	4
staining wool	—	—	—
Decatising	5	—	5
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal	4	—	6-7
normal	4-5	Good (on paper)	7
2× normal	5	—	8
Milling, alkaline — alteration	4	—	4-5
staining wool	—	—	5
Milling, acid — alteration	—	—	—
staining wool	—	—	3-4
Peroxide bleaching — alteration	—	—	—
staining wool	—	—	—
Perspiration	4	—	5
Potting — alteration	—	—	—
staining wool	—	—	2-3
Sea water — alteration	5	—	5
staining wool	—	—	5
Stoving	3-4	—	4-5
Washing — alteration	4-5	—	4-5
staining wool	—	—	5
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Good — Unaffected —		Moderate Slightly duller Unaffected Duller
<b>NON-TEXTILE USAGE</b>		Added to sized papers before or after the alum. Especially suitable for shading	
<b>NOTES</b>			



86	87	88	C.I. Acid Orange
— —	— —	— —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Reddish orange Unchanged	Yellowish orange Slightly redder	Reddish orange Little change	HUE Daylight Artificial light (tungsten)
1, 2  Poor; initial strike level — Cellulose and acetate— <i>vss</i>	1, 2  Poor; initial strike level — Acetate— <i>s</i> , cellulose— <i>ss</i>	1, 2  Poor; initial strike level — Acetate— <i>s</i> , cellulose— <i>ss</i>	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: neutral or slightly alkaline Silk: neutral or weakly acid	Nylon: neutral Silk: neutral or slightly acid	Nylon: neutral Silk: neutral or slightly acid	DYEING: OTHER FIBRES
Direct on wool, silk, nylon and viscose Vigoureux printing	Direct on wool, silk and nylon Vigoureux printing	Direct on wool, silk and nylon Vigoureux printing	PRINTING
ISO  4 4 4-5 — 5  6-7 7 7-8  5 5 — 3-4  — — 5 3 —  5 5 5 5 5	ISO  5 5 5 — 5  6-7 7 7-8  4 5 5 5  — — 5 — —  — — 4-5 4-5 5	AATCC  5 4-5 5 — 4-5  6 6-7 7  4-5 5 4-5 4-5  — — 4-5 — —  — — 4 4-5 5	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Good Unchanged — Little duller	Moderate — Unaffected —	Good — Unaffected —	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
	See Leather Dyes section	See Leather Dyes section	NON-TEXTILE USAGE
			NOTES

**C.I. Acid Orange 88:1—93**

<b>C.I. Acid Orange</b>	<b>88:1</b>	<b>89</b>	<b>90</b>
<b>CHEMICAL CLASS</b>	—	—	Monoazo (1:2 metal complex)
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)		Bright orange Slightly duller	Reddish orange Unchanged
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	Somewhat different chemically from C.I. Acid Orange 88 but similar in properties and use		1, 2  Poor; initial strike level — Cellulose and acetate— <i>ss</i>
<b>DYEING: OTHER FIBRES</b>		Nylon: ammonia + levelling agent; ammonium sulphate to exhaust Staining: cellulose— <i>ss</i> , silk and wool— <i>hs</i>	Nylon: neutral or slightly alkaline Silk: slightly acid
<b>PRINTING</b>		Direct on nylon	Direct on wool, silk and nylon
<b>FASTNESS PROPERTIES</b> Method		ISO Nylon 6	ISO
Alkali		5	4-5
Carbonising		5	5
Chlorination — alteration		4-5	5
staining wool		—	5
Decatising		5	4
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal		6-7	6-7
normal		7	7
2 × normal		7	7
Milling, alkaline — alteration		4-5	4-5
staining wool		4-5	4
Milling, acid — alteration		4	4
staining wool		4	3
Peroxide bleaching — alteration		—	—
staining wool		—	—
Perspiration		4-5	5
Potting — alteration		3	3
staining wool		2	2
Sea water — alteration		4-5	5
staining wool		5	5
Stoving		4-5	4-5
Washing — alteration		4-5	5
staining wool		4-5	4-5
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron		Good Unchanged — Unchanged	
<b>NON-TEXTILE USAGE</b>			
<b>NOTES</b>			

91	92	93	C.I. Acid Orange
Monoazo (1:2 metal complex) —	Monoazo (1:2 metal complex) 12714	Metal complex —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Orange Unchanged	Reddish orange —	Reddish orange Yellower	HUE Daylight Artificial light (tungsten)
1, 2 Poor; initial strike level — Cotton— <i>u</i> , viscose— <i>vss</i> , acetate— <i>s</i>	1, 2 — — —	1, 2 Poor; initial strike level — Cellulose— <i>s</i> , acetate— <i>ss</i>	DYEING: WOOL Method Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: neutral or slightly alkaline Silk: slightly acid		Nylon: slightly alkaline Silk: acetic acid	DYEING: OTHER FIBRES
Direct on wool, silk and nylon			PRINTING
ISO 4-5 4-5 4-5 5 — 6-7 7 7-8 4-5 4-5 3-4 3 — — 5 2 2-3 5 5 3-4 5 5		ISO 4 5 — 5 5-6 6 7 5 4-5 5 4-5 — — 5 4 3 5 5 — 5 4-5	FASTNESS PROPERTIES Method Alkali Carbonising Chlorination — alteration staining wool Decatising Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool Sea water — alteration staining wool Stoving Washing — alteration staining wool
			OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
			NON-TEXTILE USAGE
			NOTES

# C.I. Acid Orange 94—99

C.I. Acid Orange	94	95	96
<b>CHEMICAL CLASS</b>	Disazo	Disazo	Azo (metal complex)
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Bright orange Brighter (wool)*	Bright reddish orange Redder	Orange —
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	1, 2  Good; can be salted at boil — Cotton and acetate—ss	1, 2  Good; can be salted at boil — Cotton and acetate—ss	1, 2  — — —
<b>DYEING: OTHER FIBRES</b>	Nylon and silk: neutral or weakly acid	Nylon and silk: as wool	
<b>PRINTING</b>	By direct and discharge processes	Direct on wool, silk and nylon	
<b>FASTNESS PROPERTIES</b> Method	ISO Nylon	ISO Wool*	
Alkali	3-4†	—	5
Carbonising	3-4	—	4-5
Chlorination — alteration	3	—	—
staining wool	—	—	—
Decatising	4-5	5	5
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal	5-6	5-6	4
normal	6	6-7	4-5
2 × normal	6-7	7-8	5
Milling, alkaline — alteration	4	4-5	3-4
staining wool	5	—	5
Milling, acid — alteration	4-5	—	4-5
staining wool	4	—	4-5
Peroxide bleaching — alteration	4	—	—
staining wool	3-4	—	—
Perspiration	4-5	4-5	4-5
Potting — alteration	4-5	—	—
staining wool	3	—	—
Sea water — alteration	4-5	5	4-5
staining wool	5	5	4-5
Stoving	4-5	—	4
Washing — alteration	4	4-5	3-4
staining wool	5	—	5
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	4-5 (wool), 3 (nylon) 4 Much duller 3	— 4 — 4	
<b>NON-TEXTILE USAGE</b>	See Leather Dyes section	See Leather Dyes section	
<b>NOTES</b>	*Brighter and yellower on nylon †Fastness on silk: Light 5; Perspiration 4; Sea water 4; Washing 4	*Fastness on silk and nylon: Light 4-5; Alk. milling 4; Perspiration 4; Washing 4	



97	98	99	C.I. Acid Orange
Monoazo (1:2 metal complex) 13890	Monoazo (1:2 metal complex) 12695	Monoazo (1:2 metal complex) 12696	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Dull yellowish orange —	Dull orange —	Reddish orange —	HUE Daylight Artificial light (tungsten)
1, 2 Poor; initial strike level — Acetate— <i>vss</i> , cellulose— <i>ss</i>	1, 2 Poor; initial strike level — Acetate— <i>vss</i> , cellulose— <i>ss</i>	1, 2 — — Acetate— <i>vss</i> , cellulose— <i>ss</i>	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: neutral Silk: as wool	Nylon: neutral Silk: as wool	Nylon: neutral Silk: as wool	DYEING: OTHER FIBRES
Direct on wool, silk and nylon Vigoureux printing	Direct on wool, silk and nylon Vigoureux printing	Direct on wool, silk and nylon Vigoureux printing	PRINTING
ISO 4 4 3-4 3 5  5-6 6 6-7  4-5 3 4 5  4 4-5 4-5 — —  — — 4-5 4 4-5		ISO 5 4 4 4 —  6-7 7 7  4 5 4-5 5  4 4-5 4-5 — —  — — 5 4-5 4-5	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Not dischargeable 4-5 — 3-4			OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
See Leather Dyes section	See Leather Dyes section	See Leather Dyes section	NON-TEXTILE USAGE
			NOTES

# C.I. Acid Orange 100—105

C.I. Acid Orange	100	101	102
<b>CHEMICAL CLASS</b>	Monoazo (1:2 metal complex)	—	Monoazo
<b>C.I. CONSTITUTION NUMBER</b>	11640	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Bright yellowish orange —	Bright reddish orange —	Orange —
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	1, 2  Poor; initial strike level — Acetate— <i>vs</i> , cellulose— <i>ss</i>		
<b>DYEING: OTHER FIBRES</b>	Nylon: neutral Silk: as wool		
<b>PRINTING</b>	Direct on wool, silk and nylon Vigoureux printing		
<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool	ISO  5 5 4-5 5 4-5  2-3 4 4-5  4 4 3-4 3-4  3 4 5 — —  — — 4 3 4		
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron			
<b>NON-TEXTILE USAGE</b>	See Leather Dyes section	See Leather Dyes section	Anodised aluminium Fastness to light: 7
<b>NOTES</b>			

103	104	105	C.I. Acid Orange
Monoazo (1:2 metal complex) —	Monoazo (metal complex) —	Azo (1:2 metal complex) —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Orange Brighter	Reddish orange Slightly duller and yellower	Orange Slightly brighter	HUE Daylight Artificial light (tungsten)
1, 2 — — —	1, 2 Poor; initial strike level — Acetate and cotton— <i>hs</i>	1, 2 Poor; initial strike level — Acetate— <i>u</i> , cellulose— <i>s</i>	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: ammonium sulphate + sodium phosphate	Nylon: slightly alkaline Silk: neutral or slightly acid	Nylon: slightly alkaline Silk: acetic acid	DYEING: OTHER FIBRES
Direct on wool, silk and nylon			PRINTING
ISO 4 4 4 4-5 5  6-7 7 7  5 5 4 3  4-5 4 5 4 2-3  5 5 5 5 4-5	ISO 4 4 — — 5  6 6-7 7  4-5 5 — —  4-5 5 4-5 3 2  5 5 5 4-5 5	ISO Wool* 4 5 5 — 5  6 6-7 7  4-5 5 2-3 2  — — 5 3-4 2  5 4-5 4 4-5 5	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
4-5 5 — 4-5	Good Duller Unchanged Duller	— Unchanged — Unchanged	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
See Leather Dyes section			NON-TEXTILE USAGE
	Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—greenish yellow, on diln—yellowish orange	*Fastness on silk: Alkali 4; Light 5-6, 6, 7; Perspiration 4-5; Washing 4, 4-5 Fastness on nylon: Alkali 4; Light 6, 7, 7-8; Washing 5, 4-5	NOTES

### C.I. Acid Orange 106—113

C.I. Acid Orange	106	107	108
CHEMICAL CLASS	Monoazo	Monoazo (1 : 2 metal complex)	Monoazo (1 : 2 metal complex)
C.I. CONSTITUTION NUMBER	---	---	---
HUE Daylight Artificial light (tungsten)	Bright orange Slightly yellower	Reddish orange Slightly brighter and yellower	Dull orange Slightly redder
DYEING: WOOL Method	3	1, 2	1, 2
Levelling S.D.C. migration test method/grade Staining other fibres	Good; can be salted at boil — Acetate— <i>u</i> , cellulose and silk— <i>ss</i>	— — Acetate, cotton, acrylic and polyester— <i>ss</i>	Good; can be salted at boil — Acetate, cellulose, acrylic, polyester— <i>ss</i>
DYEING: OTHER FIBRES		Nylon: acetic acid Silk: neutral	Nylon: acetic acid Silk: neutral
PRINTING	Direct on wool, silk and nylon	Direct on wool, silk and nylon	Direct on wool, silk and nylon
FASTNESS PROPERTIES Method	ISO	ISO	ISO
Alkali	3-4 (duller)	4 (yellower)	4-5
Carbonising	4-5	4-5	4-5
Chlorination — alteration	3-4	4-5	4
staining wool	4-5	4-5	4-5
Decatising	4-5	4-5	4-5
Light, $\frac{1}{3}$ - $\frac{1}{2}$ normal	5-6	6-7	7
normal	6	7	7-8
2 × normal	6-7	7-8	8
Milling, alkaline — alteration	2	5	4
staining wool	2-3	5	4-5
Milling, acid — alteration	3	4-5	3-4
staining wool	2-3	3-4	3
Peroxide bleaching — alteration	2	4-5	4-5
staining wool	3	4-5	5
Perspiration	3-4	5	4-5
Potting — alteration	2	3	2-3
staining wool	2	3	2-3
Sea water — alteration	3-4 (redder)	5	5
staining wool	3	5	5
Stoving	4	4-5	4-5
Washing — alteration	1	5	4-5
staining wool	3-4	5	5
OTHER PROPERTIES Dischargeability	4	4	3-4
Effect of metals — copper	3-4 (duller)	4-5	4-5
chromium	Duller	Unaffected	Unchanged
iron	3-4 (duller)	4 (duller)	4 (duller)
NON-TEXTILE USAGE		See Leather Dyes section	
NOTES	Reaction in substance $\text{H}_2\text{SO}_4$ conc.—red; on diln—reddish yellow	Reaction in substance $\text{H}_2\text{SO}_4$ conc.—greenish yellow; on diln—orange	Reaction in substance $\text{H}_2\text{SO}_4$ conc.—yellow; on diln—yellowish orange





**C.I. Acid Orange 114—119**

<b>C.I. Acid Orange</b>	<b>114</b>	<b>115</b>	<b>116</b>
<b>CHEMICAL CLASS</b>	Azo (metal complex)	Monoazo (1:2 metal complex)	Disazo
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Bright orange Slightly redder	Reddish orange Unchanged	Dull reddish orange Redder, brighter
<b>DYEING: WOOL</b> Method	1, 2	1, 2	1, 2
Levelling S.D.C. migration test method/grade Staining other fibres	Good — Acetate and viscose— <i>u</i>	Migration poor; initial strike level — Cellulose— <i>ss</i> , acetate— <i>s</i>	Moderate — Acetate and cotton— <i>ss</i> , acrylic and viscose— <i>u</i>
<b>DYEING: OTHER FIBRES</b>	Nylon and silk: ammonium acetate	Nylon: neutral or slightly alkaline Silk: slightly acid	Nylon: neutral or weakly acid
<b>PRINTING</b>	Direct on wool, silk and nylon	Direct on wool, silk and nylon	
<b>FASTNESS PROPERTIES</b> Method	AATCC Wool	ISO	AATCC Wool*
Alkali	—	4-5	—
Carbonising	5	5	—
Chlorination — alteration	4-5	4-5	4-5 (pool water)
staining wool	—	5	5
Decatising	—	4-5	—
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	—	6	4
normal	7	6-7	5
2 × normal	—	7	5-6
Milling, alkaline — alteration	—	4-5	—
staining wool	—	4-5	—
Milling, acid — alteration	—	4	—
staining wool	—	3-4	—
Peroxide bleaching — alteration	(alk.) destroyed, (acid) 4	—	—
staining wool	—	—	—
Perspiration	5	5	4-5
Potting — alteration	2	3-4	—
staining wool	1	2-3	—
Sea water — alteration	5	5	5
staining wool	—	5	5
Stoving	4-5	4	—
Washing — alteration	4	4-5	5
staining wool	4-5	5	5
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron			— Much duller — Slightly yellower
<b>NON-TEXTILE USAGE</b>			
<b>NOTES</b>	<b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—orange; on diln—yellow USP 2852502		<b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—bright green; on diln—violet, further diln red *Fastness on nylon: Chlorine water 4-5; Light 2x normal 5-6, Perspiration 4-5; Sea water 5; Washing (II) 3, 4-5

117	118	119	C.I. Acid Orange
Monoazo —	Monoazo (1:2 metal complex) —	Monoazo —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Dull orange Yellower	Dull orange Yellower	Reddish orange Yellower, brighter	HUE Daylight Artificial light (tungsten)
1, 2  Good — Acetate and cellulose—ss	1, 2  — — Acetate—s, cellulose—ss		DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon and silk: neutral	Nylon: neutral Silk: broken soap bath	Nylon: neutral Staining of other fibres: acetate and cotton—ss, viscose and silk—hs	DYEING: OTHER FIBRES
Vigoureux printing	Direct on wool Vigoureux printing		PRINTING
ISO Wool                  Silk 4-5                  — 4-5                  — 4-5                  — 4-5                  — 5                  —  7                  6-7 7-8                  6-7 7-8                  7  4                  — 4-5                  — 2-3                  — 2-3                  —  —                  — —                  — 4-5                  — 2-3                  — 2-3                  —  5                  — 5                  — 4                  4 4                  4 5                  —	ISO — 4 5 4-5 4-5  5 5-6 6  4-5 5 4-5 4-5  5 4-5 5 2-3 2-3  4-5 4-5 4 5 5	ISO — — — — —  — 1 2  — — — —  — — 4-5 — —  — — — 3-4 2-3	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool  Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool  Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool  Perspiration Potting — alteration staining wool  Sea water — alteration staining wool  Stoving Washing — alteration staining wool
3-4 4 (duller) 4-5 4 (duller)	4 4 4 4	Poor — — —	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
			NON-TEXTILE USAGE
			NOTES

**C.I. Acid Orange 120—125**

<b>C.I. Acid Orange</b>	<b>120</b>	<b>121</b>	<b>122</b>
<b>CHEMICAL CLASS</b>	Monoazo (1:2 metal complex)	Monoazo (1:2 metal complex)	Azo (metallised)
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Dull yellowish orange Redder	Reddish orange —	Orange Brighter
<b>DYEING: WOOL</b> Method  Levelling — S.D.C. migration test method/grade Staining other fibres	1, 2  — Silk— <i>hs</i> , cellulose, triacetate, acrylic and polyester— <i>u</i>	1, 2  — Silk— <i>hs</i> , cellulose, acrylic, polyester and triacetate— <i>u</i>	1, 2  Good — Cellulose, acetate, acrylic and polyester— <i>u</i>
<b>DYEING: OTHER FIBRES</b>	Nylon: neutral	Nylon: neutral	Nylon: neutral Silk: neutral or weakly acid
<b>PRINTING</b>			Direct on wool, silk and nylon Vigoureux printing
<b>FASTNESS PROPERTIES</b> Method	ISO		ISO
	Wool	Nylon	
Alkali	4-5	5	4-5
Carbonising	4	—	—
Chlorination — alteration	4	3	—
staining wool	—	—	—
Decatising	4-5	5	4-5
Light, $\frac{1}{8}$ — $\frac{1}{2}$ normal	6-7	6	5
normal	7	6-7	6
2 × normal	7-8	7	—
Milling, alkaline — alteration	4	5	4-5
staining wool	4-5	5	4-5
Milling, acid — alteration	4	5	—
staining wool	4-5	5	—
Peroxide bleaching — alteration	4-5	—	4
staining wool	4-5	—	3
Perspiration	4-5	5	5
Potting — alteration	2-3	—	5
staining wool	1	—	3
Sea water — alteration	5	—	5
staining wool	5	—	4-5
Stoving	4	5	—
Washing — alteration	4	5	4-5
staining wool	5	—	5
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Poor 3-4 (yellower) 2-3 3	Fair 3 2-3 4	3-4 — Unchanged —
<b>NON-TEXTILE USAGE</b>			
<b>NOTES</b>			



123	124	125	C.I. Acid Orange
Azo (metallised) —	Azo —	Monoazo (metal complex) —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Reddish orange Much yellower	Bright orange Much brighter, yellower	Reddish orange —	HUE Daylight Artificial light (tungsten)
1, 2  Poor to moderate — Cellulose— <i>d</i> , acetate— <i>s</i> , acrylic— <i>hs</i>			DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: neutral Silk: neutral or weakly acid	Nylon: ammonium acetate		DYEING: OTHER FIBRES
Direct on wool, silk and nylon			PRINTING
ISO  5 — — — —  — 6 —  4-5 4 — —  5 4 4-5 4-5 2-3  5 5 — 5 5	ISO  3-4 — — — —  4 5-6 —  — — — —  5 — — 4-5 —		FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{8}$ – $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
5 Slightly affected — Much affected	Dischargeable to white — — —		OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
		Anodised aluminium, Fastness to light: 6-7	NON-TEXTILE USAGE
Solubility 50 g/l at 80°C	Solubility: 95 g/l at 80°C		NOTES

### C.I. Acid Orange 126—130

C.I. Acid Orange	126	127	128
<b>CHEMICAL CLASS</b>	Monoazo (metal complex)	Azo	Disazo
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Dull orange —	Reddish orange Brighter, redder	Bright yellowish orange —
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres			
<b>DYEING: OTHER FIBRES</b>		Nylon: ammonium salt Back tanning improves wet fastness properties	Nylon: neutral or slightly acid
<b>PRINTING</b>			
<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool		ISO  — — 5 — 5  — — — — — — — — — 5 — — 5 — — 5 —	ISO  — — — — —  1% 7 4% 7-8 —  — — — — — — — — 4-5 — — — 4-5 — 4 —
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron		Dischargeable to white — — —	— Yellower — Redder
<b>NON-TEXTILE USAGE</b>	Anodised aluminium Fastness: Light 7-8; Weather very good		
<b>NOTES</b>			<b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—greenish blue; on diln—greenish black ppt

129	130	C.I. Acid Orange
Azo (metal complex)	Azo (1:2 metal complex)	CHEMICAL CLASS
—	—	C.I. CONSTITUTION NUMBER
Reddish orange Yellower	Orange Unchanged	HUE Daylight Artificial light (tungsten)
		DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
		DYEING: OTHER FIBRES
	Vigoureux printing	PRINTING
ISO Nylon — — 3-4 — —  — 7 —  — — — —  — — 4-5 — —  4-5 — — 4-5 4-5	ISO Wool* 4-5 4-5 4-5 — 4-5  7 7 7-8  4 4 4 3-4  4 3-4 4-5 2-3 2-3  5 4-5 4 4 4-5	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool  Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
— 3 — 4	Dischargeable to a good white 4 4-5 4	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
		NON-TEXTILE USAGE
	Fastness on silk: Light 6, 6-7, 6-7; Perspiration 4; Stoving 4 (greener); Washing 4 Fastness on nylon: Light 6, 6-7, 6-7; Perspiration, Alk milling and Washing 4-5; Sea water 5 Solubility: 80 g/l dist. water	NOTES

# C.I. Acid Orange 131—136

C.I. Acid Orange	131	132	133
<b>CHEMICAL CLASS</b>	Monoazo	Disazo	Azo (metal complex)
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Orange Redder	Yellowish orange —	Orange —
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres			
<b>DYEING: OTHER FIBRES</b>	Nylon: neutral or weakly acid. Good reserve of polyester and triacetate, medium reserve of cotton. Medium uniformity of dyeings on nylon-wool mixtures and blends	Nylon: neutral or slightly acid	Silk and nylon
<b>PRINTING</b>			
<b>FASTNESS PROPERTIES</b> Method	ISO	AATCC	ISO Silk and nylon
Alkali	—	—	—
Carbonising	—	—	—
Chlorination — alteration staining wool	5*	—	—
Decatising	—	—	—
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal	—	—	—
normal	—	7	6
2 × normal	—	—	—
Milling, alkaline — alteration staining wool	—	—	—
Milling, acid — alteration staining wool	—	—	—
Peroxide bleaching — alteration staining wool	—	—	—
Perspiration	4-5	4-5	4
Potting — alteration staining wool	—	—	—
Sea water — alteration staining wool	4-5	—	—
Stoving	—	—	—
Washing — alteration staining wool	4-5	4-5	5
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	5 — — —		
<b>NON-TEXTILE USAGE</b>			See Leather Dyes section
<b>NOTES</b>	Fastness figures given are for nylon 6.6; those for nylon 6 are slightly lower *Chlorinated water	<b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—reddish black; on diln—pale dull yellow	



<b>134</b>	<b>135</b>	<b>136</b>	<b>C.I. Acid Orange</b>
Monoazo <b>16149</b>	Azo —	Monoazo —	<b>CHEMICAL CLASS</b> <b>C.I. CONSTITUTION NUMBER</b>
Reddish orange —	Orange —	Bright orange —	<b>HUE</b> Daylight Artificial light (tungsten)
	— — Cellulose—vss, acrylic—u		<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres
	Silk: brighter hue than on wool	Nylon (fabrics and carpets)	<b>DYEING: OTHER FIBRES</b>
		Nylon (fabrics and carpets) by direct processes	<b>PRINTING</b>
	ISO 3-4 5 2-3 — 5  4 5 5-6  1-2 2-3 — — — 4 — —  4-5 3 — 2-3 4-5	AATCC — — — — —  3-4 (weaker) 4 (weaker) —  — — — — — — — — —  — — — 4-5 (weaker) (Test IIA) 5	<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{8}$ - $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
	Good — — —		<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron
Cosmetics (water-based)			<b>NON-TEXTILE USAGE</b>
		<b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—reddish orange; on diln—yellow	<b>NOTES</b>

**C.I. Acid Orange 137—140**

<b>C.I. Acid Orange</b>	<b>137</b>	<b>138</b>	<b>139</b>
<b>CHEMICAL CLASS</b>	Azo	Disazo	Monoazo (metallised)
<b>C.I. CONSTITUTION NUMBER</b>	19235	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Dull orange (meat casings)* —	Dull reddish orange* Much brighter	Reddish orange Yellower, brighter*
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres		3  Moderate 2-3 Cotton— <i>hs</i> , polyester— <i>s</i>	3, 4  Moderate 2-3 Cotton— <i>hs</i> , polyester— <i>ss</i>
<b>DYEING: OTHER FIBRES</b>		Nylon: levelling poor Staining cotton, polyester— <i>s</i> Silk: from an acetic acid bath; levelling moderate	Nylon: levelling moderate Silk: from an acetic acid bath
<b>PRINTING</b>		Not suitable	
<b>FASTNESS PROPERTIES</b> Method		ISO	ISO
Alkali		Wool 4      Nylon 4	Wool 4-5      Nylon 4-5
Carbonising		3      —	3-4      —
Chlorination — alteration		4      —	4      —
staining wool		4      —	4-5      —
Decatising		4-5      5	4-5      4-5
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal		4      4	6      5-6
normal		4-5      5	6-7      6
2 × normal		5      5-6	—      6-7
Milling, alkaline — alteration		—      4-5	4      4-5
staining wool		—      5 (nylon)	4      4-5 (nylon)
Milling, acid — alteration		3-4      4	2-3      4
staining wool		2-3      4 (nylon)	2      4 (nylon)
Peroxide bleaching — alteration		3      3	4      4
staining wool		2      3-4 (nylon)	3-4      4
Perspiration		3-4      4	4-5      4-5
Potting — alteration		2      3	2      4
staining wool		1      2 (nylon)	2      2 (nylon)
Sea water — alteration		3-4      5	4-5      5
staining wool		3      4-5 (nylon)	4-5      4-5 (nylon)
Stoving		—      —	3-4      —
Washing — alteration		4 (No.1)      4-5 (No.3)	4      4-5
staining wool		4      5 (nylon)	3-4      5 (nylon)
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron		Moderate Duller (nylon) — Duller (nylon)	Good Little change Little duller Duller
<b>NON-TEXTILE USAGE</b>	Mainly for colouring casings or surfaces of sausages and frankfurters *Bright scarlet on wool		
<b>NOTES</b>	Literature: USP 3,285,906 US Federal Register, Vol. 31, No. 1, 4 January, 1966	*Reddish orange on nylon	*Nylon: much yellower, brighter







C.I. Acid Red	1	2	3
<b>CHEMICAL CLASS</b>	Monoazo	Monoazo	Monoazo
<b>C.I. CONSTITUTION NUMBER</b>	18050	13020	14910
<b>HUE</b> Daylight Artificial light (tungsten)	Bright bluish red Yellower and brighter	— —	Bluish red Duller
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	3  I/4 Acetate and cellulose— <i>u</i>	Of no interest. See Notes	2,3  I/3 Acetate and cellulose— <i>u</i>
<b>DYEING: OTHER FIBRES</b>	Nylon: formic acid Silk: acetic or sulphuric acid		
<b>PRINTING</b>	Direct on nylon, silk and wool		Direct on wool
<b>FASTNESS PROPERTIES</b> Method	AATCC	ISO	ISO
Alkali	3-4*	4	4
Carbonising	4	3	4
Chlorination — alteration	1	2	2
staining wool	—	3	4
Decatising	4-5	4	3
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal	4	4-5	2
normal	4	5	3
2 × normal	5	5-6	3
Milling, alkaline — alteration	1-2	1	1
staining wool	1-2	2	1
Milling, acid — alteration	—	2	3
staining wool	—	1	1
Peroxide bleaching — alteration	1	1	1
staining wool	1	4	2
Perspiration	2	4-5	3
Potting — alteration	—	2	1
staining wool	—	2	1
Sea water — alteration	2	2	2
staining wool	2	1	1
Stoving	4	4	4-5
Washing — alteration	2	3	2
staining wool	2	5	3-4
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Moderate Little bluer and duller — Bluer and much weaker		Good Duller — —
<b>NON-TEXTILE USAGE</b>	Cosmetics, drugs, inks, paper, plastics, pigments (as barium salt), soap, wood stains See C.I. Food Red 10 See Leather Dyes section		Paper
<b>NOTES</b>	*Fastness properties on nylon (AATCC): Light 2-3; Washing 4	Indicator: pH range 4.2 (red) to 6.3 (yellow)	

### C.I. Acid Red 4—9

C.I. Acid Red	4	5	6
CHEMICAL CLASS	Monoazo	Monoazo	Monoazo
C.I. CONSTITUTION NUMBER	14710	14905	14680
HUE	Bright red Yellower and brighter	Red Yellower	Yellowish red Slightly yellower
Daylight Artificial light (tungsten)			
DYEING: WOOL	3	3	1, 2, 3
Method			
Levelling S.D.C. migration test method/grade Staining other fibres	Good — Acetate and cellulose—u	May be salted at the boil I/4-5 Acetate and cellulose—u	Good; may be salted at boil — Acetate and cellulose—u
DYEING: OTHER FIBRES			Silk: degumming liquor with acetic acid
PRINTING	Direct on nylon and wool	Direct on wool	Direct on silk and wool
FASTNESS PROPERTIES	AATCC	AATCC	ISO
Method	ISO	ISO	
Alkali	3	3-4	4
Carbonising	4	4	4-5
Chlorination — alteration	1	3	2
staining wool	—	—	—
Decatising	3	4-5	5
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	4	4	3
normal	4	5	4
2 × normal	5	5	4-5
Milling, alkaline — alteration	1	2	2
staining wool	—	—	—
Milling, acid — alteration	—	—	3
staining wool	—	—	1
Peroxide bleaching — alteration	1	—	1
staining wool	—	—	4
Perspiration	3	2-3	4
Potting — alteration	—	—	1
staining wool	—	—	1
Sea water — alteration	1	2-3	2
staining wool	—	—	1
Stoving	4	4	4
Washing — alteration	1	2-3	2
staining wool	—	—	4-5
OTHER PROPERTIES	Moderate	Good	Good
Dischargeability	Duller	Bluer and duller	Duller
Effect of metals — copper	—	—	—
chromium	Duller	Weaker and duller	Duller and weaker
iron			
NON-TEXTILE USAGE	Paper, pigments, sealing wax See Leather Dyes section		
NOTES			

7	8	9	C.I. Acid Red
Monoazo 14895	Monoazo 14900	Monoazo 15635	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Bluish red Somewhat yellower	Bright yellowish red Little change	Yellowish red Slightly yellower	HUE Daylight Artificial light (tungsten)
3  May be salted at the boil 1/4 Acetate and cellulose— <i>u</i>	3  Moderate to good — Acetate and cellulose— <i>u</i>	2, 3  Good — Acetate and cellulose— <i>s</i>	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: formic acid Silk: degumming liquor with acetic or sulphuric acid	Silk: degumming liquor with formic or sulphuric acid	Silk: degumming liquor, neutral or acid, with Glauber's salt	DYEING: OTHER FIBRES
	Direct on silk and wool		PRINTING
AATCC 4 3 4 4 4  3 4 4-5  2 2 — —  1 1 3 — —  2 2 3-4 4 4	ISO 4 2 1 3-4 4  3 4 4-5  1 4 2 1  1 4 3 1 1  1 1 4 2 5	ISO 3-4 4 4 — 4  1-2 2 2-3  2-3 3-4 1-2 —  3 — 2-3 1-2 —  2 — 2 3 3	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Good Duller — Bluer, weaker and duller	Good Little duller — Little duller	Good Yellower — Duller	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
Soap, wood stains and writing inks		Paper See Leather Dyes section	NON-TEXTILE USAGE
		Wet fastness properties are lower on silk than on wool, but may be improved by aftertreatment with tannin and tartar emetic	NOTES

# C.I. Acid Red 10—15

C.I. Acid Red	10	11	12
<b>CHEMICAL CLASS</b>	Monoazo	Monoazo	Monoazo
<b>C.I. CONSTITUTION NUMBER</b>	15640	16040	14835
<b>HUE</b> Daylight Artificial light (tungsten)	Yellowish red Bluer	Red —	Bluish red Little yellower
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	3  Moderate — Acetate and cellulose—ss	From acid bath	3  — III/3 Acetate and cellulose—u
<b>DYEING: OTHER FIBRES</b>	Silk: Sulphuric acid and Glauber's salt		
<b>PRINTING</b>	Direct on silk		
<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool	ISO  4 4-5 — — 4  3 3 3-4  2 — — —  — — 2-3 — —  1-2 — 4 2-3 —		<b>DIRECT</b> ISO  3 4 1 3 4  2 3 4  1 3 3 1  1 4 2 1 1  3 2 4 2 5
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Moderate to good Little duller — Little duller		Poor Duller and bluer Can be used as an afterchrome dye Weaker and duller
<b>NON-TEXTILE USAGE</b>			
<b>NOTES</b>			See C.I. Mordant Blue 78



13	14	15	C.I. Acid Red	
Monoazo 16045	Monoazo 14720	Monoazo 17930	CHEMICAL CLASS C.I. CONSTITUTION NUMBER	
Red Little change	Bluish red Yellower	Yellowish red Brighter	HUE Daylight Artificial light (tungsten)	
3  Moderate — Acetate and cellulose— ss to u	3  — III/3-4 Acetate and cellulose—u	3  Good — —	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres	
Silk (unweighted): de- gumming liquor with acetic, formic or sulph- uric acid Jute: acid	Nylon: acetic or formic acid Silk: formic or sulphuric acid with Glauber's salt		DYEING: OTHER FIBRES	
	Direct on nylon, silk and wool		PRINTING	
ISO  3-4 4-5 — — 4-5  2-3 3 3-4  2 — 3 —  1-2 — 2 3 —  2-3 — 3 2-3 3	AATCC  2 4 1 — 3-4  2 3 6  2-3 2-3 — —  1 1-2 2-3 — —  3-4 3-4 5 3 3	ISO  3 4 1 4-5 3-4  2 3 4  1 4 3 2  1 4-5 3 1 1  2 1 3-4 2 5	AATCC  2 3-4 — — —  — 6 —  4 — — —  — — 3 — —  — — 4 3-4 —	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Good Little change — Duller and weaker	Good Duller Can be used as a navy afterchrome dye Much duller		OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron	
Feathers, paper, soap, wood, cosmetics and drugs See C.I. Food Red 4 See Leather Dyes section	Anodised aluminium, inks, paper, pigments (as heavy metal salts), wood stains Also as a biological stain and in cos- metics and drugs See C.I. Food Red 3 See Leather Dyes section		NON-TEXTILE USAGE	
On silk fastness proper- ties are generally as on wool, but fastness to washing and perspira- tion is lower. Wet fast- ness properties are im- proved by aftertreat- ment with tannin and tartar emetic	See C.I. Mordant Blue 79		NOTES	

# C.I. Acid Red 16—21

C.I. Acid Red	16	17	18
CHEMICAL CLASS	Monoazo	Monoazo	Monoazo
C.I. CONSTITUTION NUMBER	14920	16180	16255
HUE Daylight Artificial light (tungsten)	Red Slightly brighter and bluer	Bluish red Yellower	Bright red Yellower
DYEING: WOOL Method	2, 3	3	2, 3
Levelling S.D.C. migration test method/grade Staining other fibres	Moderate to good — Acetate and cellulose— <i>u</i>	Moderate — Acetate and cellulose— <i>ss</i>	Moderate — Acetate and cellulose— <i>u</i>
DYEING: OTHER FIBRES		Silk: sulphuric acid, or de- gumming liquor + sulphuric acid	Nylon: Acetic or formic acid Silk: acetic or sulphuric acid
PRINTING	Direct on wool		Direct on nylon, silk and wool
FASTNESS PROPERTIES Method	ISO	AATCC	ISO
Alkali	3-4	2	3
Carbonising	3-4	4	3-4
Chlorination — alteration	—	—	3
staining wool	—	—	—
Decatising	4-5	4	4
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	3	—	2
normal	4	4	3
2 × normal	5	—	3
Milling, alkaline — alteration	2-3	1	1-2
staining wool	—	—	—
Milling, acid — alteration	3-4	—	3
staining wool	—	—	—
Peroxide bleaching — alteration	1-2	2	2
staining wool	—	—	—
Perspiration	2	2	2
Potting — alteration	—	—	—
staining wool	—	—	—
Sea water — alteration	2	2	2-3
staining wool	—	—	—
Stoving	2	1-2	3
Washing — alteration	2-3	2	3
staining wool	3	—	—
OTHER PROPERTIES			
Dischargeability	Good	Good	Good
Effect of metals — copper	Distinct change	Bluer and duller	Bluer and duller
chromium	—	—	—
iron	Slight change	Bluer and duller	Bluer and duller
NON-TEXTILE USAGE		Paper, pigments (as barium salt), biological stain See Leather Dyes section	Inks, paper, plastics, wood stains, drugs and cosmetics See C.I. Food Red 7 See Leather Dyes section
NOTES			

19	20	21	C.I. Acid Red
Monoazo 16605	Monoazo 14830	Monoazo 14965 (similar)	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Bright bluish red Slightly yellower	Red Slightly yellower	Bright red Yellower and brighter	HUE Daylight Artificial light (tungsten)
3  Moderate — Acetate and cellulose— <i>u</i>	2, 3  Moderate — Acetate and cellulose— <i>ss</i>	3  Good — Acetate— <i>u</i> , cellulose— <i>ss</i>	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
	Silk: degumming liquor		DYEING: OTHER FIBRES
Direct on wool	Direct on silk and wool	Direct on wool	PRINTING
ISO  2 4 — 5  4 5 5-6  2 — —  4-5 2 — —  5 3 5	ISO  3-4 4 — 4-5  2-3 3 3-4  2 — —  2 2 1 —  2-3 — 3 3 1-2	AATCC  3 5 — — —  5 5-6 6  1 — — —  1 1 — —  1 — 3 1 —	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ - $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Moderate Unchanged — Slightly duller	Good Slightly duller — Little duller	Moderate Bluer and duller — Duller	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
	See Leather Dyes section	See Leather Dyes section	NON-TEXTILE USAGE
			NOTES

**C.I. Acid Red 22—26**

<b>C.I. Acid Red</b>	<b>22</b>	<b>23</b>	<b>24</b>
<b>CHEMICAL CLASS</b>	Monoazo	Monoazo	Monoazo
<b>C.I. CONSTITUTION NUMBER</b>	14940	16130	16140
<b>HUE</b> Daylight Artificial light (tungsten)	Red Slightly yellower	Red Slightly yellower	Yellowish red Slightly yellower
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	3  Moderate — Acetate— <i>u</i> , cellulose— <i>s</i>	3  Good; may be salted at boil — Acetate— <i>ss</i> , cellulose— <i>u</i>	3  Moderate — Acetate and cellulose— <i>ss</i>
<b>DYEING: OTHER FIBRES</b>		Silk: acetic or sulphuric acid	Silk: acetic acid
<b>PRINTING</b>	Direct on wool		
<b>FASTNESS PROPERTIES</b> Method	ISO	ISO	ISO
Alkali	3	2-3	3-4
Carbonising	3-4	4	4
Chlorination — alteration staining wool	— —	2 —	3-4 —
Decatising	4	4-5	4
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	3	2	1
normal	4	3	1-2
2 × normal	4	3-4	2
Milling, alkaline — alteration staining wool	2-3 —	1-2 —	2 —
Milling, acid — alteration staining wool	3-4 —	2-3 —	2-3 —
Peroxide bleaching — alteration staining wool	1 —	4 —	2 —
Perspiration	2-3	2	2
Potting — alteration staining wool	— —	1-2 —	— —
Sea water — alteration staining wool	2-3 —	2 —	2 —
Stoving	4	4	3-4
Washing — alteration staining wool	4 3	2-3 —	2 —
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Good Duller — Duller	Good Slightly bluer — Bluer	Good Duller — Duller
<b>NON-TEXTILE USAGE</b>			Paper, pigment (barium salt)
<b>NOTES</b>			



25	25:1	26	C.I. Acid Red
Monoazo 16050	Monoazo 16047	Monoazo 16150	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Red Brighter	Red —	Bright yellowish red Slightly yellower and brighter	HUE Daylight Artificial light (tungsten)
3 Good — Acetate and cellulose—ss	Similar to C.I. Acid Red 25 in properties and usage	3 — I/2 Acetate and cellulose—u	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Silk: degumming liquor + sulphuric acid		Nylon: formic acid Silk: formic or sulphuric acid	DYEING: OTHER FIBRES
		Direct on silk and wool	PRINTING
AATCC      ISO 5            3 3            4 —            — —            — 5            5  2            2 3            3-4 4            4  1            — —            — —            —  —            1 —            — 1            2 —            — —            —  1            2 —            — 1            — 1            — —            —		AATCC      ISO 3            4 4            5 5            3 5            4 4-5        3-4  —            2 4            3 —            4  1            1 1            1 —            3 —            1  1-2        1 1-2        4 1-2        4 2            3 2            1  2-3        3 2-3        2 1-2        2 2            3-4 2            5	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Moderate to good Slightly duller — Duller		Good Duller and bluer — Slightly weaker and duller	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
Pigments (as barium and aluminium salts)		Inks, paper, pigments (heavy metal salts), wood stains, drugs and cosmetics See C.I. Food Red 5 See Leather Dyes section	NON-TEXTILE USAGE
			NOTES

**C.I. Acid Red 26:1—30**

C.I. Acid Red	26:1	26:2	27																																														
CHEMICAL CLASS	Monoazo	Monoazo	Monoazo																																														
C.I. CONSTITUTION NUMBER	16151	16152	16185																																														
HUE Daylight Artificial light (tungsten)	Bright red —	Bright red —	Bluish red Yellower																																														
DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres	Similar to C.I. Acid Red 26 in properties and usage	Similar to C.I. Acid Red 26 in properties and usage	2, 3  — III/2 Acetate and cellulose— <i>u</i>																																														
DYEING: OTHER FIBRES			Silk: sulphuric or acetic acid																																														
PRINTING			Direct on silk and wool																																														
FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool			<table><tr><th>AATCC</th><th>ISO</th></tr><tr><td>3</td><td>—</td></tr><tr><td>4-5</td><td>3-4</td></tr><tr><td>—</td><td>1</td></tr><tr><td>—</td><td>5</td></tr><tr><td>4</td><td>3-4</td></tr><tr><td>—</td><td>3</td></tr><tr><td>5</td><td>3</td></tr><tr><td>—</td><td>4</td></tr><tr><td>1</td><td>1</td></tr><tr><td>1</td><td>4</td></tr><tr><td>—</td><td>3</td></tr><tr><td>—</td><td>1</td></tr><tr><td>2</td><td>1</td></tr><tr><td>2</td><td>4-5</td></tr><tr><td>3-4</td><td>3-4</td></tr><tr><td>2</td><td>2-3</td></tr><tr><td>2</td><td>2</td></tr><tr><td>1</td><td>3</td></tr><tr><td>1</td><td>2</td></tr><tr><td>1</td><td>1</td></tr><tr><td>3</td><td>3</td></tr><tr><td>3</td><td>5</td></tr></table>	AATCC	ISO	3	—	4-5	3-4	—	1	—	5	4	3-4	—	3	5	3	—	4	1	1	1	4	—	3	—	1	2	1	2	4-5	3-4	3-4	2	2-3	2	2	1	3	1	2	1	1	3	3	3	5
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OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron			Good Little change — Duller																																														
NON-TEXTILE USAGE			Paper, phenol-formaldehyde resins, pigments ( as barium salt), wood, drugs, cosmetics and leather See C.I. Food Red 9																																														
NOTES																																																	

28	29	30	C.I. Acid Red
— —	Monoazo 16570	Monoazo 17035	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Red —	Bright red Yellower	Red Slightly yellower	HUE Daylight Artificial light (tungsten)
	3 Very good — Acetate and cellulose—u	3 — 1/4 Acetate and cellulose—u	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
	Nylon: acetic or formic acid Silk: acetic acid		DYEING: OTHER FIBRES
		Direct on silk and wool	PRINTING
	DIRECT AATCC                      ISO  1                      1-2 5                      4 —                      3 —                      — —                      4  —                      — 4-5                      4-5 —                      —  1                      1-2 —                      — —                      3-4 —                      —  1                      1 —                      — 1                      2 —                      1 —                      —  2-3                      2 —                      — 2                      3-4 2-3                      2 —                      —	ISO  4 3 2 3-4 4  5-6 6 6-7  1 5 3 1  1 4 3 2 1  3 1 4 2-3 5	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool  Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool  Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
	Moderate Bluer and duller Blue when afterchromed Much bluer and weaker	Good Duller Little change Duller	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
Artificial flowers, cosmetics, feathers, gelatin, inks and stamping inks	Melamine, urea and nitro- cellulose plastics, biological stain and leather	Bath salts; salts as pigments for paper and nitrocellu- lose finishes	NON-TEXTILE USAGE
	See C.I. Mordant Blue 80		NOTES

### C.I. Acid Red 31—35

C.I. Acid Red	31	32	33
CHEMICAL CLASS	Monoazo	Monoazo	Monoazo
C.I. CONSTITUTION NUMBER	16540	17065	17200
HUE Daylight Artificial light (tungsten)	Bluish red Little yellower	Bluish red Yellower and brighter	Bright red Yellower
DYEING: WOOL Method	3	2, 3	3
Levelling S.D.C. migration test method/grade Staining other fibres	Good — Acetate and cellulose— <i>u</i>	— I/4-5 Acetate and cellulose— <i>u</i>	Good — Acetate and cellulose— <i>u</i>
DYEING: OTHER FIBRES	Silk (unweighted): broken degumming liquor. Wet fastness properties are improved by aftertreatment with tannin and tartar emetic	Nylon: formic acid Silk: acetic acid and Glauber's salt or broken degumming liquor	Nylon: acetic or formic acid Silk: acetic or sulphuric acid
PRINTING	Direct on silk and wool	Direct on nylon and wool	Direct on wool
FASTNESS PROPERTIES Method	ISO	AATCC ISO	AATCC ISO
Alkali	3	4-5 4	4 3-4
Carbonising	5	2-3 4-5	5 4-5
Chlorination — alteration	—	— 2	— 2-3
staining wool	—	— 4	—
Decatising	4	3-4 4	— 4
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal	4	— 5-6	—
normal	4	6 6	2-3 2
2 × normal	5	— 6	—
Milling, alkaline — alteration	1	3 1	1 2
staining wool	—	3 1	—
Milling, acid — alteration	3	— 2	— 2
staining wool	—	— 1	—
Peroxide bleaching — alteration	1	2 1	1 2
staining wool	—	2 1	—
Perspiration	2-3	2-3 3-4	1 2
Potting — alteration	—	— 1	— 1-2
staining wool	—	— 1	—
Sea water — alteration	3	4 3-4	4 2-3
staining wool	—	4 2	—
Stoving	4	4 4-5	5 3
Washing — alteration	2	2 3	2-3 2-3
staining wool	3-4	2 3	—
OTHER PROPERTIES			
Dischargeability	Moderate	Moderate to good	Good
Effect of metals — copper	Bluer	Slightly duller	Bluer and duller
chromium	—	—	—
iron	Bluer and weaker	Slightly duller	Much bluer and duller
NON-TEXTILE USAGE		Paper Salts as pigments See Leather Dyes section	Wood stains, biological stain, cosmetics and drugs See C.I. Food Red 12 See Leather Dyes section
NOTES			



34	34:1	35	C.I. Acid Red
Monoazo 17030	— —	Monoazo 18065	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Bright bluish red Slightly yellower	Bright bluish red —	Bright bluish red Yellower and brighter	HUE Daylight Artificial light (tungsten)
3 Good — Acetate and cellulose—ss	Similar to C.I. Acid Red 34 in properties and usage, but slightly different chemically	3 — 1/3 Acetate—ss, cellulose—u	DYEING: WOOL Method Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: sulphuric acid Silk: sulphuric acid		Nylon: formic acid Silk: acetic or sulphuric acid or broken degumming liquor	DYEING: OTHER FIBRES
		Direct on silk and wool	PRINTING
AATCC      ISO		AATCC      ISO	FASTNESS PROPERTIES Method
3      4		3      4	Alkali
3      4		2      1	Carbonising
—      2		—      4	Chlorination — alteration
—      4		—      4	staining wool
5      6		5      3-4	Decatising
5-6      6-7		3      4	Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal
6      7		4      4-5	normal
		5      5	2 × normal
1-2      2		2      1	Milling, alkaline — alteration
—      —		2      2	staining wool
—      3-4		—      3	Milling, acid — alteration
—      —		—      1	staining wool
—      3		1      1	Peroxide bleaching — alteration
—      —		1      3	staining wool
3      3		1      3-4	Perspiration
—      3		—      1	Potting — alteration
—      —		—      1	staining wool
3      2		1-2      2	Sea water — alteration
—      —		1-2      1	staining wool
4-5      2-3		5      2	Stoving
3      2-3		1-2      2	Washing — alteration
—      —		1-2      5	staining wool
Good Much duller — Much duller		Moderate Slightly bluer — Slightly bluer	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
Paper and casein plastics (surface dyeing) See Leather Dyes section		Paper See Leather Dyes section	NON-TEXTILE USAGE
			NOTES

**C.I. Acid Red 36—41**

<b>C.I. Acid Red</b>	<b>36</b>	<b>37</b>	<b>38</b>
<b>CHEMICAL CLASS</b>	Monoazo	Monoazo	Monoazo (metallised)
<b>C.I. CONSTITUTION NUMBER</b>	—	17045	18880
<b>HUE</b> Daylight Artificial light (tungsten)	Bright red Yellower	Bluish red Slightly yellower and brighter	Yellowish red Slightly yellower
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	3  Good — Acetate and cellulose— <i>u</i>	3  — I/3 Acetate and cellulose— <i>u</i>	3  Moderate — Acetate and cellulose— <i>u</i>
<b>DYEING: OTHER FIBRES</b>	Nylon: formic acid	Nylon: acetic acid Silk: formic or sulphuric acid	
<b>PRINTING</b>		Direct on silk and wool	
<b>FASTNESS PROPERTIES</b> Method	AATCC	AATCC	ISO
Alkali	5	4-5	4
Carbonising	3	4	2
Chlorination — alteration	—	—	1
staining wool	—	—	4
Decatising	5	4	3-4
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	—	—	5-6
normal	6	6	5-6
2 × normal	—	—	6
Milling, alkaline — alteration	2	1	1
staining wool	—	1	2
Milling, acid — alteration	—	—	2
staining wool	—	—	1
Peroxide bleaching — alteration	—	2-3	1
staining wool	—	2-3	4
Perspiration	3	2	4
Potting — alteration	—	—	2
staining wool	—	—	1
Sea water — alteration	4	2	2
staining wool	—	2	1
Stoving	—	3-4	4
Washing — alteration	3	2	2
staining wool	—	2	5
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	— Duller — Duller	Good Bluer and duller — Duller	Moderate to good Slightly duller — Duller
<b>NON-TEXTILE USAGE</b>		Anodised aluminium, paper, soaps, salts as pigments for nitrocellulose finishes See Leather Dyes section	
<b>NOTES</b>	<b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—red		<b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—reddish orange



**C.I. Acid Red 42—47**

C.I. Acid Red	42	43	44		
CHEMICAL CLASS	Monoazo	Monoazo	Monoazo		
C.I. CONSTITUTION NUMBER	17070	—	16250		
HUE Daylight Artificial light (tungsten)	Bluish red Little change	Red Yellower and brighter	Bright red Little change		
DYEING: WOOL Method	2, 3	3	3		
Levelling S.D.C. migration test method/grade Staining other fibres	Good — Acetate and cellulose—u	May be salted at the boil 1/4 Acetate and cellulose—u	Moderate — Acetate and cellulose—ss		
DYEING: OTHER FIBRES	Nylon: formic acid Silk: acetic acid + Glauber's salt or broken degumming liquor		Silk: acetic or sulphuric acid		
PRINTING	Direct on nylon, silk and wool	Direct on wool	Direct on silk and wool		
FASTNESS PROPERTIES Method	AATCC	ISO	AATCC	ISO	ISO
Alkali	4	4-5	4	4-5	3*
Carbonising	4	4	5	3-4	4-5
Chlorination — alteration	1	—	—	1	3
staining wool	—	—	—	4	—
Decatising	4	5	3	4	4-5
Light, 1/2 — 1/2 normal	5	6	4	5	2
normal	6	6	5	5-6	3
2 × normal	6	6-7	5	6	4
Milling, alkaline — alteration	2-3	2-3	1	1	2
staining wool	—	—	1	1	—
Milling, acid — alteration	—	3	—	2	2-3
staining wool	—	—	—	1	—
Peroxide bleaching — alteration	2-3	3-4	—	1	2
staining wool	—	—	—	1	—
Perspiration	3	3-4	2	3	2
Potting — alteration	—	—	—	1	1-2
staining wool	—	—	—	1	—
Sea water — alteration	3	3	2	3	2-3
staining wool	—	—	2	1	—
Stoving	4	4	1-2	2	3
Washing — alteration	2	2	1	2	2-3
staining wool	1-2	2-3	1	2	3
OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron	Good Slight change Little change Weaker and duller	Good Much duller — Very much duller	Good Bluer — Bluer		
NON-TEXTILE USAGE	See Leather Dyes Section	Paper	See Leather Dyes section		
NOTES			*Fastness properties on silk (ISO): Light 2, Washing 1		



45	46	47	C.I. Acid Red	
Monoazo —	— —	Disazo 27300	CHEMICAL CLASS C.I. CONSTITUTION NUMBER	
Bluish red Yellower and brighter	Bright yellowish red Little change	Bright bluish red Somewhat yellower	HUE Daylight Artificial light (tungsten)	
3  May be salted at the boil I/4-5 Acetate and cellulose— <i>u</i>	3  — I/3 Acetate— <i>hs</i> , cellulose— <i>ss</i>	3  Moderate — Acetate and cellulose— <i>u</i>	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres	
	Silk: acetic or sulphuric acid	Silk: acetic, formic or sulphuric acid Jute, coir and straw	DYEING: OTHER FIBRES	
Direct on wool	Direct on silk and wool	Direct on silk and wool	PRINTING	
AATCC 4 5 — — 5  4 5 5  1 1 — —  — — 1 — — 1 1 4 1 1	ISO 4-5 4 1 3 4  5-6 5-6 6  1 1 2 1  1 1 2 1  3 1 4-5 2 1	AATCC 3-4 3 — — 3  1 2 2  1 1 — —  — — 3 — — 2-3 2-3 4-5 1 1	ISO — 2 3 4 4  1 2 2  1 3 2 1  1 2 3 1 1  3 2 2 3 2 3 3	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, ½-½ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Moderate Weaker — Bluer and duller	Very poor Much bluer — Duller	Good Little bluer and duller — Yellower and weaker	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron	
Paper, salts as pigments	Paper	Paper	NON-TEXTILE USAGE	
			NOTES	

**C.I. Acid Red 48—53**

<b>C.I. Acid Red</b>	<b>48</b>	<b>49</b>	<b>50</b>
<b>CHEMICAL CLASS</b>	—	Monoazo	Xanthene
<b>C.I. CONSTITUTION NUMBER</b>	—	—	45220
<b>HUE</b> Daylight Artificial light (tungsten)	Bright bluish red Little change	Bright bluish red Less bluish	Bright yellowish pink Yellower
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	2, 3  May be salted at boil 1/4 Acetate— <i>hs</i> , cellulose — <i>s</i>	3  Good. May be salted at boil — Acetate and cellulose— <i>u</i>	3  Good. May be salted at boil — Acetate and cellulose— <i>u</i>
<b>DYEING: OTHER FIBRES</b>	Silk: sulphuric or acetic acid	Silk: acetic acid	Silk: broken degumming liquor
<b>PRINTING</b>		Direct on silk and wool	Direct on silk, wool and viscose rayon. Discharge styles as an illuminating colour on silk and wool
<b>FASTNESS PROPERTIES</b> Method	AATCC	ISO	ISO
Alkali	3-4	4-5	3
Carbonising	5	3	4
Chlorination — alteration	—	4	2
staining wool	—	4-5	—
Decatising	3	3-4	4
Light, 1/2—1/2 normal	1	1	2
normal	2	2	3
2 × normal	2	2	3-4
Milling, alkaline — alteration	1	1	2
staining wool	1	3	—
Milling, acid — alteration	—	3-4	—
staining wool	—	1	—
Peroxide bleaching — alteration	—	1	3
staining wool	—	2	1-2
Perspiration	3	4	3
Potting — alteration	—	2	—
staining wool	—	1	—
Sea water — alteration	3	3	4
staining wool	3	2	2-3
Stoving	5	4	—
Washing — alteration	1	3	4
staining wool	1	1	3
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Very poor Much bluer Little change Little change	Good Bluer — Bluer	Poor Little duller — Little duller
<b>NON-TEXTILE USAGE</b>	Paper		Paper See Leather Dyes section
<b>NOTES</b>	Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—orange		

51	52	53	C.I. Acid Red	
Xanthene 45430	Xanthene 45100	Monoazo 13055	CHEMICAL CLASS C.I. CONSTITUTION NUMBER	
Bluish pink Yellower	Bright bluish pink Redder	Yellowish red (acetate)* Slightly yellower	HUE Daylight Artificial light (tungsten)	
2  Poor — Acetate— <i>u</i> , cellulose— <i>ss</i>	3  May be salted at the boil 1/4 Acetate and cellulose— <i>u</i>		DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres	
Nylon: acetic or sulphuric acid Silk: neutral or acetic acid	Nylon: formic acid Silk: formic or sulphuric acid	Acetate and nylon: neut- tral or weakly acid	DYEING: OTHER FIBRES	
Direct on silk and wool. Il- luminating discharge effects on silk	Direct on silk and wool. Il- luminating discharge effects on silk and wool	Direct and discharge styles on acetate and nylon	PRINTING	
AATCC 4 2 — — 4  1 1 1  3 — — —  1 — 4 — —  2-3 — 4 3 —	AATCC 2 3-4 1 3 4  1-2 2-3 2-3  2 2 — —  1 2 3 — —  4 2-3 4 3 3	ISO Acetate† 4-5 — — — —  5 5-6 6  — — — —  — — 3 — —  — — — —	ISO Nylon — — — — —  4 4 4  — — — —  — — 5 — —  — — — —	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, 1/2-1/2 normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Poor Slightly bluer — —	Very poor Little duller — Little duller	— — — —	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron	
Inks, stamping inks, lac- quers, paper, pigments (as aluminium and lead salts), biological stains, cosmetics and drugs See C.I. Food Red 14	Paper See Leather Dyes section	Surface dyeing of casein plastics For level pastel shades on wool, sheepskins and furs	NON-TEXTILE USAGE	
		Silk and wool are dyed more heavily than acetate; cellulose is heavily stained  *Duller on nylon  †Fastness to gas fume fad- ing 5	NOTES	

**C.I. Acid Red 54—59**

<b>C.I. Acid Red</b>	<b>54</b>	<b>55</b>	<b>56</b>
<b>CHEMICAL CLASS</b>	Monoazo	Monoazo	Disazo
<b>C.I. CONSTITUTION NUMBER</b>	17020	—	27180
<b>HUE</b> Daylight Artificial light (tungsten)	Bright yellowish red Slightly yellower	Bright red Little yellower	Bluish red —
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	3  Good. May be salted at boil — Acetate and cellulose—u	2, 3  — I/4 Acetate and cellulose—ss	3  Moderate — —
<b>DYEING: OTHER FIBRES</b>		Silk: acetic or sulphuric acid	Silk: acetic acid
<b>PRINTING</b>			
<b>FASTNESS PROPERTIES</b> Method	ISO	ISO	
Alkali	5	3-4	
Carbonising	4	3	
Chlorination — alteration	3-4	4	
staining wool	—	4	
Decatising	5	4	
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	5-6	3	
normal	6	4	
2 × normal	6-7	4-5	
Milling, alkaline — alteration	2	1	
staining wool	1	2	
Milling, acid — alteration	2	3	
staining wool	—	1	
Peroxide bleaching — alteration	4-5	1	
staining wool	—	2	
Perspiration	2-3	3	
Potting — alteration	—	1	
staining wool	—	1	
Sea water — alteration	2	2	
staining wool	—	3	
Stoving	4	2	
Washing — alteration	4	3	
staining wool	5	1	
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Good Little change — Duller	Moderate Considerable change Little change Little change	
<b>NON-TEXTILE USAGE</b>			
<b>NOTES</b>			



57		58		59	C.I. Acid Red
Monoazo —		— —		Monoazo —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Bright bluish red Much yellower		Bright bluish red Duller and yellower		Bright bluish red Less blue	HUE Daylight Artificial light (tungsten)
1, 2, 3  Good — Acetate and cellulose— <i>u</i>		2, 3  — I/2-3 Acetate and cellulose— <i>u</i>		3  Moderate — Acetate— <i>hs</i> , cellulose— <i>ss</i>	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: acetic acid or ammonium acetate* Silk: acetic, formic or sulphuric acid		Silk: acetic or formic acid		Silk: acetic acid	DYEING: OTHER FIBRES
		Direct on silk and wool			PRINTING
AATCC	ISO	AATCC	ISO	ISO	FASTNESS PROPERTIES Method
4-5	4-5	4	4	3	Alkali
5	5	5	4	3-4	Carbonising
3-4	3-4	4-5	3	4	Chlorination — alteration
—	—	4-5	4-5	—	staining wool
5	5	5	4-5	4-5	Decatising
5	5	4	5	3	Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal
5-6	5-6	4-5	5-6	4	normal
6-7	6-7	5	6-7	4-5	2 × normal
2-3	2-3	4	2	2-3	Milling, alkaline — alteration
2-3	2-3	4	2	—	staining wool
—	—	—	3	3	Milling, acid — alteration
—	—	—	1	—	staining wool
1	—	—	1	2	Peroxide bleaching — alteration
—	—	—	1	—	staining wool
3-4	4	4-5	3-4	2	Perspiration
—	—	—	2	1	Potting — alteration
—	—	—	1	—	staining wool
3-4	3-4	4-5	4	3	Sea water — alteration
—	—	4-5	2	—	staining wool
4-5	4-5	5	4	4	Stoving
4	4-5	4-5	3	2-3	Washing — alteration
4	4-5	4-5	1	—	staining wool
Moderate to good Unchanged — Duller		Poor Little change Little change Little change		Poor Slightly duller — Much duller	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
See Leather Dyes Section					NON-TEXTILE USAGE
Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—dull scarlet *Suitable for differential-dyeing nylon Fastness on nylon: Light 5, 5, 5-6; Perspiration (acid) 5†; Washing (test 3) 4-5† †Dyeings syntan aftertreated		Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—dull bluish red			NOTES

**C.I. Acid Red 60—65**

<b>C.I. Acid Red</b>	<b>60</b>	<b>61</b>	<b>62</b>
<b>CHEMICAL CLASS</b>	Monoazo	—	Monoazo
<b>C.I. CONSTITUTION NUMBER</b>	16645	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Bluish red —	Bright red Little change	Yellowish red Slightly less yellow
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	3  Good — —	2, 3  Good. May be salted at boil — Acetate and cellulose—u	3  Good. May be salted at boil — Acetate and cellulose—ss
<b>DYEING: OTHER FIBRES</b>		Silk: acetic or sulphuric acid	Silk: acetic or formic acid
<b>PRINTING</b>			Direct on silk and wool
<b>FASTNESS PROPERTIES</b> Method	ISO	ISO	ISO
Alkali	2-3	4-5	3-4
Carbonising	4-5	4	5
Chlorination — alteration	—	—	3-4
staining wool	—	—	—
Decatising	—	5	4
Light, $\frac{1}{2}$ — normal	—	4	3
normal	4-5	4-5	3-4
2 × normal	—	5	4
Milling, alkaline — alteration	—	—	2-3
staining wool	—	—	—
Milling, acid — alteration	—	3	3
staining wool	—	—	—
Peroxide bleaching — alteration	—	4-5	4
staining wool	—	—	—
Perspiration	—	4	3
Potting — alteration	3	—	1
staining wool	—	—	—
Sea water — alteration	—	—	3
staining wool	—	—	—
Stoving	5	5	4
Washing — alteration	—	3-4	3
staining wool	—	5	—
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	— — Bluish black when afterchromed —	Good Duller Little change Slightly duller	Good Slightly bluer — Much duller
<b>NON-TEXTILE USAGE</b>			
<b>NOTES</b>	See C.I. Mordant Blue 81		

63	64	65	C.I. Acid Red
— —	Monoazo —	Disazo  24830	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Bright bluish red Slightly yellower	Bright bluish red Much yellower	Yellowish red Little yellower	HUE Daylight Artificial light (tungsten)
3  Moderate — Acetate—ss, cellulose—u	3  Good — Acetate and cellulose—u	3  Moderate — Acetate—u, cellulose—vss	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
		Silk: broken degumming liquor. Fastness to washing and water improved by after-treatment with tannin and tartar emetic	DYEING: OTHER FIBRES
	Direct on wool	Direct on silk and wool	PRINTING
ISO  4 5 — 4-5  3 5 5-6  1-2 — — —  — — 1-2 — —  2-3 — 4 2-3 —	AATCC  3 3 — — —  4 4-5 5  1 — — —  1 — — —  3-4 — 5 1 —	ISO  3-4 4-5 — — 4  2-3 3 3-4  3 — — —  1 — 3 2 —  4-5 — 4 3 3-4	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ - $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Good Little duller — Little duller	Moderate to good Bluer and duller — Much bluer and duller	Good Little bluer and duller — Little duller	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
	Melamine, urea and nitro-cellulose plastics	Salts as pigments (C.I. Pigment Red 61) See Leather Dyes section	NON-TEXTILE USAGE
Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—violet	Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—red		NOTES

**C.I. Acid Red 66—71**

<b>C.I. Acid Red</b>	<b>66</b>	<b>67</b>	<b>68</b>
<b>CHEMICAL CLASS</b>	Disazo	Disazo	Monoazo
<b>C.I. CONSTITUTION NUMBER</b>	26905	—	17920
<b>HUE</b> Daylight Artificial light (tungsten)	Yellowish red Little change	Bright yellowish red Yellower	Red Little change
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	2, 3  Moderate — Acetate— <i>u</i> , cellulose— <i>ss</i>	3  Good — Acetate and cellulose— <i>u</i>	3  Good. May be salted at boil — Acetate and cellulose— <i>u</i>
<b>DYEING: OTHER FIBRES</b>	Nylon: acetic or formic acid Silk: acetic or sulphuric acid		Silk: broken degumming liquor
<b>PRINTING</b>			Direct on wool
<b>FASTNESS PROPERTIES</b> Method	AATCC	ISO	ISO
Alkali	3	2-3	3-4
Carbonising	5	5	4
Chlorination — alteration	—	4	—
staining wool	—	—	—
Decatising	—	4	5
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	—	3	4
normal	4	3-4	4-5
2 × normal	—	4-5	5
Milling, alkaline — alteration	4	3-4	2
staining wool	2	5	1-2
Milling, acid — alteration	—	3	—
staining wool	—	—	2
Peroxide bleaching — alteration	1	5	1
staining wool	—	—	—
Perspiration	3	3	2
Potting — alteration	—	—	—
staining wool	—	—	—
Sea water — alteration	4	—	2-3
staining wool	—	—	—
Stoving	2	1-2	2-3
Washing — alteration	4	3-4	3
staining wool	2	5	3
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Good Bluer and duller Little change Duller	Moderate Slightly duller — Slightly duller	Good Duller Little change Duller
<b>NON-TEXTILE USAGE</b>	Paper, pigment (aluminium salt), biological stain	Fur (hat bodies)	
<b>NOTES</b>	See C.I. Mordant Red 92		





**C.I. Acid Red 72—76:1**

C.I. Acid Red	72	73	74	
CHEMICAL CLASS	—	Disazo	Monoazo	
C.I. CONSTITUTION NUMBER	—	27290	13355	
HUE Daylight Artificial light (tungsten)	Red Little change	Yellowish red Slightly yellower and brighter	Red —	
DYEING: WOOL Method	3	2, 3	Acid bath	
Levelling	Moderate to good	—	—	
S.D.C. migration test method/grade	—	I/2	—	
Staining other fibres	Acetate and cellulose —u	Acetate and cellulose—ss	—	
DYEING: OTHER FIBRES		Nylon: acetic or formic acid Silk: acetic, formic or sulphuric acid Jute Cotton occasionally with addition of alum		
PRINTING		Direct on nylon, silk and wool		
FASTNESS PROPERTIES Method	ISO	AATCC	ISO	
Alkali	3-4	2	3*	Moderate
Carbonising	5	5	3-4	
Chlorination — alteration	—	—	1	
staining wool	—	—	4	
Decatising	5	5	4-5	Moderate
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal	3	3	5	
normal	3	5	6	
2 × normal	4	6	6-7	
Milling, alkaline — alteration	1-2	1	1	Poor
staining wool	—	1	4	
Milling, acid — alteration	—	—	3	
staining wool	—	—	2	
Peroxide bleaching — alteration	—	2	1	
staining wool	—	2	4	
Perspiration	2	1	3	
Potting — alteration	—	—	2	
staining wool	—	—	2	
Sea water — alteration	1-2	2-3	3	
staining wool	—	2-3	2	
Stoving	2-3	1	1	
Washing — alteration	1-2	4	3	
staining wool	—	4	5	
OTHER PROPERTIES Dischargeability	Good	Good		
Effect of metals — copper	Duller	Much duller		
chromium	—	—		
iron	Duller	Duller		
NON-TEXTILE USAGE		Anodised aluminium, inks, milled soaps, pigments (heavy metal salts), plastics, typewriter ribbons, wood stains, biological stains, cosmetics and drugs See C.I. Solvent Red 30 (dicyclohexylamine salt) See Leather Dyes section		
NOTES		Fastness on silk is generally similar to that on wool *Fastness on nylon (ISO): Light 4, 4-5, 5; Perspiration 4-5†; Washing 4-5† †Dyeings syntan aftertreated		

<b>75</b>	<b>76</b>	<b>76:1</b>	<b>C.I. Acid Red</b>
— —	Monoazo <b>18115</b>	Monoazo —	<b>CHEMICAL CLASS</b> <b>C.I. CONSTITUTION NUMBER</b>
Bright yellowish red Little change	Bright bluish red Yellower	Bright bluish red —	<b>HUE</b> Daylight Artificial light (tungsten)
2, 3 — I/3 Acetate and cellulose—ss	2 Moderate — Acetate and cellulose—ss	Similar to C.I. Acid Red 76 in properties and usage, but slightly different chemically	<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres
	Silk: acetic or formic acid		<b>DYEING: OTHER FIBRES</b>
	Direct on silk and wool		<b>PRINTING</b>
<b>ISO</b> 4 2 4 4 3-4  3 4 5  1 2 2 1  1 2 3-4 1 1  1 2 2 2 2	<b>AATCC</b> 3-4 4-5 4 — 4-5  3 3-4 4  2 2 — —  1 — 3 —  2 — 5 4-5 4-5	<b>ISO</b> 3-4 4 4 — 4-5  3 4 5  2-3 1-2 3 —  2-3 4 1 —  3-4 — 4 4 5	<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool  Decatising  Light, $\frac{1}{3}$ - $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Moderate to good Little change Little change Little change	Good Bluer — Bluer		<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron
	Paper, phenol-formalde- hyde, urea and melamine casting resins See Leather Dyes section		<b>NON-TEXTILE USAGE</b>
			<b>NOTES</b>

**C.I. Acid Red 77—82**

<b>C.I. Acid Red</b>	<b>77</b>	<b>78</b>	<b>79</b>
<b>CHEMICAL CLASS</b>	—	—	—
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Bright bluish red Little change		Red Little change
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	3  Good — —	This C.I. Generic Name is discontinued. The dyes formerly listed under it now appear under C.I. Acid Red 88	3  Moderate — Acetate and cellulose—ss
<b>DYEING: OTHER FIBRES</b>	Silk: acetic or sulphuric acid		
<b>PRINTING</b>	Direct on wool		
<b>FASTNESS PROPERTIES</b> Method	ISO		ISO
Alkali	3		3-4
Carbonising	4-5		5
Chlorination — alteration	4		—
staining wool	—		—
Decatising	4-5		5
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal	3		3
normal	3		4
2 × normal	3		4-5
Milling, alkaline — alteration	—		1-2
staining wool	—		—
Milling, acid — alteration	2		—
staining wool	—		—
Peroxide bleaching — alteration	4-5		—
staining wool	—		—
Perspiration	4		2
Potting — alteration	—		—
staining wool	—		—
Sea water — alteration	—		2
staining wool	—		—
Stoving	4-5		4
Washing — alteration	3-4		2
staining wool	5		—
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Poor Duller — Duller		Good Little duller — Duller
<b>NON-TEXTILE USAGE</b>			
<b>NOTES</b>			





**C.I. Acid Red 83—88**

<b>C.I. Acid Red</b>	<b>83</b>	<b>84</b>	<b>85</b>
<b>CHEMICAL CLASS</b>	Anthraquinone	—	Disazo
<b>C.I. CONSTITUTION NUMBER</b>	68220	—	22245
<b>HUE</b> Daylight Artificial light (tungsten)	Bright red Little yellower	Red —	Yellowish red Slightly yellower and brighter
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	3  Moderate to good — Acetate and cellulose—u		1, 2  — IV/1 Acetate—ss, cellulose—s
<b>DYEING: OTHER FIBRES</b>	Silk: broken degumming liquor		Nylon: acetic acid or neutral Silk: acetic acid or neutral
<b>PRINTING</b>	Direct on silk and wool		Direct on nylon, silk, viscose rayon and wool
<b>FASTNESS PROPERTIES</b> Method	ISO		AATCC      ISO
Alkali	4		4      4*
Carbonising	4-5		5      3-4
Chlorination — alteration	—		4      3
staining wool	—		4      4-5
Decatising	4		4-5      4
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	5-6		4      4
normal	6-7		4-5      4-5
2 × normal	7		5      5
Milling, alkaline — alteration	2-3		3-4      4
staining wool	—		3-4      4
Milling, acid — alteration	3		—      3
staining wool	—		—      4
Peroxide bleaching — alteration	3		3-4      3
staining wool	—		3-4      3
Perspiration	2-3		5      4
Potting — alteration	—		—      2
staining wool	—		—      1
Sea water — alteration	3		5      3
staining wool	—		5      4
Stoving	4		2      1
Washing — alteration	2-3		4      3
staining wool	3-4		4      4
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Poor Duller Little change Little change		Moderate Little duller Little change Little duller
<b>NON-TEXTILE USAGE</b>	Anodised aluminium	Leather: on vegetable, chrome and semi-chrome tannages; gloving and upholstery leathers	Casein plastics and synthetic resins See Leather Dyes section
<b>NOTES</b>			*Fastness properties on nylon (ISO): Light 4, 5, 5-6; Perspiration 5; Washing (Test 3) 5 (staining wool 5)

1153

**C.I. Acid Red 89—94**

<b>C.I. Acid Red</b>	<b>89</b>	<b>90</b>	<b>91</b>
<b>CHEMICAL CLASS</b>	Disazo	Azo	Xanthene
<b>C.I. CONSTITUTION NUMBER</b>	23910	—	45400
<b>HUE</b> Daylight Artificial light (tungsten)	Red Little change	Red Little change	Bright bluish red Less bluish
<b>DYEING: WOOL</b> Method	2	1, 2	2
Levelling	—	—	Poor
S.D.C. migration test method/grade	IV/1	—	—
Staining other fibres	Acetate and cellulose—u	—	Acetate and cellulose—ss
<b>DYEING: OTHER FIBRES</b>	Nylon: acetic acid Silk: acetic acid or neutral Straw, jute and coir	Silk: neutral or weakly alkali line soap bath	Silk: neutral or acetic acid
<b>PRINTING</b>	Direct on silk, viscose and wool; discharge printing on silk and wool		
<b>FASTNESS PROPERTIES</b> Method	AATCC	ISO	ISO
Alkali	3-4	4	2
Carbonising	4	4	4
Chlorination — alteration	—	3	3-4
staining wool	—	5	—
Decatising	4	4	4
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal	3	3-4	2
normal	3	4	3
2 × normal	4	4-5	4
Milling, alkaline — alteration	3	3	3
staining wool	3	2	—
Milling, acid — alteration	—	3	1-2
staining wool	—	4-5	—
Peroxide bleaching — alteration	3	3	3
staining wool	3	4	—
Perspiration	4	4	3
Potting — alteration	—	3	2
staining wool	—	1	—
Sea water — alteration	4	4	3
staining wool	4	4	—
Stoving	2-3	1	4
Washing — alteration	3	3	3
staining wool	3	4-5	—
<b>OTHER PROPERTIES</b> Dischargeability	Good	—	Poor
Effect of metals — copper	Little duller	Considerable change	Bluer
chromium	—	—	—
iron	Much duller	Duller	Bluer
<b>NON-TEXTILE USAGE</b>	Paper Salts as pigments See Leather Dyes section		Inks, pencils
<b>NOTES</b>			



92	93	94	C.I. Acid Red
Xanthene 45410	Xanthene 45435	Xanthene 45440	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Bright pink Yellower	Bluish red —	Bright bluish pink Yellower	HUE Daylight Artificial light (tungsten)
2  Poor — Acetate and cellulose— <i>ss</i>	2  — — —	2  Moderate to poor — Acetate and cellulose— <i>u</i>	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: formic acid Silk: neutral or acetic acid	Silk: acetic acid Coir, jute and straw	Nylon: acetic and sulphuric acid Silk: acetic acid	DYEING: OTHER FIBRES
Direct on silk and wool		Direct on silk and wool Coloured discharge styles	PRINTING
AATCC      ISO 4      —* 2      — —      — —      — —      —  1      — —      —  3      — —      — —      — —      — —      — —      — —      — —      — —      — 3-4      — 3      — —      —		AATCC      ISO 3      5 2      4 —      — —      — 3-4      5  —      — 1      1 —      —  3      — —      — —      — —      —  —      1 —      — 4      4 —      4 —      —  3-4      5 —      — 3-4      — 4      4 —      —	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Not dischargeable — — —		Poor Little effect — Little effect	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
Inks, stamping inks, lacquers, paper, biological stain, cosmetics, drugs, indicator	Inks, paper, wood chip, cosmetics and drugs Salts as pigments	Inks, paper, straw, wood chips, biological stain, cosmetics	NON-TEXTILE USAGE
*Fastness properties on silk (ISO): Light (normal) 1; Washing 2	Ext. D & C Reds Nos. 5 and 6 are the disodium and dipotassium salts respectively		NOTES

**C.I. Acid Red 95—100**

<b>C.I. Acid Red</b>	<b>95</b>	<b>96</b>	<b>97</b>
<b>CHEMICAL CLASS</b>	Xanthene	Azo	Disazo
<b>C.I. CONSTITUTION NUMBER</b>	45425	—	22890
<b>HUE</b> Daylight Artificial light (tungsten)	Yellowish red —	Bright red Yellower	Bright yellowish red Slightly yellower
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	2  — — —	1, 2  Good — Acetate and cellulose— <i>u</i>	1, 2  — IV/1 Acetate and cellulose— <i>u</i>
<b>DYEING: OTHER FIBRES</b>	Silk: acetic acid Coir, jute and straw	Nylon: Acetic acid and Glauber's salt	Nylon: acetic acid Silk: acetic acid or Glauber's salt Jute
<b>PRINTING</b>			Direct on silk and wool
<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool		AATCC  4-5 4-5 — — 3-4  — 5 —  3-4 — — — — — 2-3 — — 3-4 — — — 3-4 — —	AATCC      ISO  4-5      4 4      3-4 1      4 —      4 4      4  2      3-4 3      4 4-5      4-5  3      2 3      3-4 —      3 —      4  2-3      3 —      5 3-4      4-5 —      3 —      1  4      4 4      3 2-3      1 4      3 4      4
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron		Fairly good — Little change —	Good Duller — Much duller
<b>NON-TEXTILE USAGE</b>	Inks, paper Salts as pigments See C.I. Solvent Red 73		Paper Salts as pigments See Leather Dyes section
<b>NOTES</b>	D & C Oranges 11, 12 and 13 are the sodium, potassium and ammonium salts respect- ively	<b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—violet	

98	99	100	C.I. Acid Red
Xanthene 45405	Disazo 23285	Polyazo —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Bluish red —	Red Brighter and yellower	Yellowish red Slightly yellower	HUE Daylight Artificial light (tungsten)
2  Poor — —	1, 2  — IV/1 Acetate and cellulose—s		DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
	Nylon: acetic acid or neutral Silk: acetic acid or neutral Jute and coir	Silk (weighted and unweighted)	DYEING: OTHER FIBRES
	Direct on nylon, silk, viscose or wool		PRINTING
Very low	AATCC                  ISO 4                        4 4-5                     3 4                        3 4                        5 4-5                     3-4  —                        4-5 4-5                     5 —                        5-6  3-4                     3-4 3-4                     5 —                        4 —                        5  3-4                     3-4 3-4                     4-5 5                        4-5 3                        3 3                        1  5                        4-5 5                        5 3                        1 4                        3-4 4                        4-5	AATCC Silk — — — — —  — 6 —  — — — — — — — — — — — 4 — — — 4 —	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool  Decatising  Light, $\frac{1}{3}$ - $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
	Moderate to good Slightly duller — Duller and weaker		OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
	Synthetic resins See Leather Dyes section		NON-TEXTILE USAGE
Wet fastness properties only poor-moderate		Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—dull red-dish violet	NOTES

**C.I. Acid Red 101—106**

<b>C.I. Acid Red</b>	<b>101</b>	<b>102</b>	<b>103</b>
<b>CHEMICAL CLASS</b>	Azine	Monoazo	Azine
<b>C.I. CONSTITUTION NUMBER</b>	50085	14730	50090
<b>HUE</b> Daylight Artificial light (tungsten)	Bluish red Yellower	Red Brighter	Red Little yellower
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	3  Good. May be salted at boil — Acetate— <i>ss</i> , cellulose— <i>u</i>	2, 3  — III/3 Acetate and cellulose— <i>ss</i>	3  Good. May be salted at boil — Acetate and cellulose— <i>ss</i>
<b>DYEING: OTHER FIBRES</b>	Silk: broken degumming liquor	Silk: acetic, formic or sulphuric acid	Silk: broken degumming liquor
<b>PRINTING</b>	Direct on silk and wool	Direct on nylon, silk and wool	Direct on silk and wool
<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool	ISO  2-3 4 — — 4  2 3 4  1-2 — — —  1-2 — 2 1 —  2 — 3 2-3 —	ISO  3-4 3 2 4 4  2 3 4  1 4 2 2  1 3-4 4 2 1  3 1 4 3 4-5	ISO  3 4 — — 4  2-3 3 4  1-2 — — —  1-2 — 2 1 —  2-3 — 3 2-3 3
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Poor Little duller — Bluer and duller	Good Little duller — Little duller	Poor Duller Little change Bluer and duller
<b>NON-TEXTILE USAGE</b>	See Leather Dyes section	See Leather Dyes section	See Leather Dyes section
<b>NOTES</b>	On silk the wet fastness properties are improved by aftertreatment with tannic acid and tartar emetic		On silk the wet fastness properties are improved by aftertreatment with tannin and tartar emetic



104	105	106	C.I. Acid Red	
Disazo 26420	— —	Monoazo 18110	CHEMICAL CLASS C.I. CONSTITUTION NUMBER	
Red Slightly yellower	Red Yellower	Bright red Yellower and brighter	HUE Daylight Artificial light (tungsten)	
1, 2 — IV/1-2 Acetate and cellulose—s	3 Moderate — Acetate—ss, cellulose—u	2, 3 — III/2 Acetate and cellulose—u	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres	
Nylon: acetic acid or neutral Silk: acetic acid or neutral	Silk: acetic or sulphuric acid Jute and coir	Nylon: acetic or formic acid Silk (unweighted): acetic acid and Glauber's salt	DYEING: OTHER FIBRES	
Direct on silk and wool	Direct on silk and wool	Direct on silk and wool	PRINTING	
AATCC 3 3 — — 3  — 5 —  1-2 1-2 — —  — — 2-3 — —  4 4 4-5 3 —	ISO 4 2 3-4 5 5  4 5 5-6  3-4 3 3 3  3 1 4 1 1  4 4 3 4 1	ISO 3 4 — — 4-5  3-4 4 4-5  1-2 — — —  — — 2-3 — —  1-2 — 2 —	AATCC 2 4-5 — — —  — 4-5 —  1 1 — —  1 1 2 — —  3-4 3-4 5 2 2	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Good Slightly duller Little change Somewhat duller	Good Little duller — Duller	Good Bluer Little change Duller	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron	
Casein plastics See Leather Dyes section	Paper	Anodised aluminium, paper, pigments (heavy metal salts) See Leather Dyes section	NON-TEXTILE USAGE	
			NOTES	

**C.I. Acid Red 107—112**

<b>C.I. Acid Red</b>	<b>107</b>	<b>108</b>	<b>109</b>
<b>CHEMICAL CLASS</b>	Monoazo	Monoazo	Polyazo
<b>C.I. CONSTITUTION NUMBER</b>	18025	18000	—
<b>HUE</b> Daylight Artificial light (tungsten)	Bright bluish red Little yellower	Bright red Little yellower	Bright red Slightly yellower
<b>DYEING: WOOL</b> Method	2	2	2
Levelling S.D.C. migration test method/grade Staining other fibres	Moderate — Acetate and cellulose—u	Moderate — Acetate and cellulose—u	Moderate — —
<b>DYEING: OTHER FIBRES</b>	Silk: broken degumming liquor	Silk: broken degumming liquor	Silk: acetic acid and Glauber's salt
<b>PRINTING</b>	Direct on wool	Direct on wool	
<b>FASTNESS PROPERTIES</b> Method	ISO	ISO	AATCC
Alkali	2	2	—
Carbonising	4-5	4	—
Chlorination — alteration	—	—	—
staining wool	—	—	—
Decatising	4-5	5	—
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal	4	4-5	—
normal	4-5	5	5
2 × normal	5	5-6	—
Milling, alkaline — alteration	2	2	4
staining wool	—	—	—
Milling, acid — alteration	—	—	—
staining wool	—	—	—
Peroxide bleaching — alteration	2	1	—
staining wool	—	—	—
Perspiration	2	2	3
Potting — alteration	1-2	1	—
staining wool	—	—	—
Sea water — alteration	3	3	—
staining wool	—	—	—
Stoving	4	4	—
Washing — alteration	3-4	3	3
staining wool	2	2-3	—
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Poor Little bluer Little change Bluer and duller	Poor Little duller — Much bluer	
<b>NON-TEXTILE USAGE</b>	See C.I. Pigment Red 67	Paper See C.I. Pigment Red 66	
<b>NOTES</b>	On silk the wet fastness properties may be improved by aftertreatment with tannin and tartar emetic	On silk the wet fastness properties may be improved by aftertreatment with tannin and tartar emetic	<b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—emerald green

1161

# C.I. Acid Red 113—117

C.I. Acid Red	113	114	115
CHEMICAL CLASS	Monoazo	Disazo	Disazo
C.I. CONSTITUTION NUMBER	—	23635	27200 or 27201
HUE Daylight Artificial light (tungsten)	Bright red Yellower and brighter	Bright red —	Bluish red Yellower and brighter
DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres	3  Good — Acetate and cellulose— <i>u</i>	2  Moderate — Acetate and cellulose— <i>ss</i>	2  Moderate — Acetate and cellulose— <i>ss</i>
DYEING: OTHER FIBRES		Silk: acetic acid or neutral Jute	Nylon: formic acid Silk: acetic, formic or sulphuric acid
PRINTING	Direct on silk and wool	Direct on silk and wool	Direct on silk and wool
FASTNESS PROPERTIES Method	AATCC	ISO	AATCC      ISO
Alkali	2	4-5*	5      4
Carbonising	4	5	5      3
Chlorination — alteration	—	4	—      2
staining wool	—	5	—      4-5
Decatising	—	4-5	3-4      3-4
Light, $\frac{1}{8}$ — $\frac{1}{2}$ normal	4	3	—      4
normal	4	3	3-4      4-5
2 × normal	6	3-4	—      4-5
Milling, alkaline — alteration	1	4-5	2      2
staining wool	—	—	2      3
Milling, acid — alteration	—	4	—      4
staining wool	—	4-5	—      3
Peroxide bleaching — alteration	3	4-5	2      1
staining wool	—	4-5	2      2
Perspiration	2	4-5	3      3
Potting — alteration	—	—	—      1
staining wool	—	—	—      1
Sea water — alteration	3	4-5	3      4
staining wool	—	5	3      4
Stoving	5	4-5	3-4      1
Washing — alteration	1-2	4 (ISO 2)	2      3
staining wool	—	5	2      3
OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron	Moderate Bluer and duller — Duller	Good Duller Little change Duller	Good Slightly bluer and duller — Bluer and duller
NON-TEXTILE USAGE	See Leather Dyes section Paper	See Leather Dyes Section	Pigments (heavy metal salts) See Leather Dyes section
NOTES	Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—reddish violet	Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—violet *Fastness properties on nylon (ISO): Light 3-4, 4, 4-5; Milling (alkaline) 4-5; Perspiration 5; Sea water 5; Washing (ISO 2) 5 (Staining wool 5); Water 5	





**C.I. Acid Red 118—123**

C.I. Acid Red	118	119	120		
CHEMICAL CLASS	—	—	Monoazo		
C.I. CONSTITUTION NUMBER	—	—	—		
HUE Daylight Artificial light (tungsten)	Yellowish red Slightly yellower	Bordeaux Little change	Bluish red Yellower and brighter		
DYEING: WOOL Method	1, 2	1, 2	1, 2		
Levelling S.D.C. migration test method/grade Staining other fibres	Good; may be salted at boil — Acetate— <i>hs</i> , cellulose— <i>ss</i>	Moderate (acetic); good (neutral) — Acetate and cellulose— <i>ss</i>	— IV/3 Acetate— <i>u</i> , cellulose— <i>ss</i>		
DYEING: OTHER FIBRES	Silk: acetic acid or neutral	Silk: acetic acid or neutral	Silk: acid, or degum- ming liquor		
PRINTING	Direct on silk and wool	Direct on nylon, silk, viscose and wool	Direct on silk and wool		
FASTNESS PROPERTIES Method	AATCC	ISO	AATCC	ISO	ISO
Alkali	4-5	4-5	—	4-5*	5
Carbonising	4	4-5	4-5	4-5	4
Chlorination — alteration	4-5	3	2	3	4
staining wool	—	—	—	—	5
Decatising	4-5	4-5	4	4	4
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal	4	5	—	4	5
normal	4-5	5-6	4	4-5	5-6
2 × normal	5	6	—	5-6	6
Milling, alkaline — alteration	3	3	—	4	2
staining wool	3	2-3	—	4	3
Milling, acid — alteration	—	—	4	3	4
staining wool	—	—	2	—	1
Peroxide bleaching — alteration	—	—	4	4-5	3
staining wool	—	—	3	—	1
Perspiration	4-5	4	5	4-5	4
Potting — alteration	—	—	—	—	1
staining wool	—	—	—	—	1
Sea water — alteration	4-5	4-5	3-4	4	4
staining wool	—	—	—	—	3
Stoving	5	5	1	2	4-5
Washing — alteration	4-5	4-5	5	4	2
staining wool	4-5	5	5	4-5	1
OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron	Poor Slightly weaker and duller Little change Weaker and duller	Moderate Unaffected Little change Slight change	Good Little duller Little change Duller		
NON-TEXTILE USAGE	See Leather Dyes section	See Leather Dyes section	See Leather Dyes section		
NOTES	Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—violet	*Fastness properties on nylon (ISO): Chlorinated water 4-5; Decatising (mild) 3-4; Hot pressing (immediately) 3-4, (after 4 hrs) 5; Light 5-6, 6, 6; Perspiration 4-5; Pleating 4-5; Rubbing 4-5; Sea water 4; Water 4; Washing (Test 3) 4-5 (Staining wool 4)			

121	122	123	C.I. Acid Red
— —	— —	Disazo —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Bluish red Yellower	Bright bluish red Yellower	Yellowish red Yellower	HUE Daylight Artificial light (tungsten)
2  — IV/4 Acetate and cellulose—u	1, 2  Moderate (acetic); good (neutral) — Acetate and cellulose—u	1, 2  — IV/1 Acetate and cellulose —ss	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: acetic acid	Silk: acetic acid or neutral	Silk: acetic acid	DYEING: OTHER FIBRES
	Direct on nylon, silk, viscose and wool	Direct on silk and wool	PRINTING
AATCC      ISO	AATCC      ISO	AATCC      ISO	FASTNESS PROPERTIES Method
5 3 — — 3-4	4 1 3-4 5 3-4	— 5 — — 5	3 5 3-4 3 3
3 4 —	3 4 5	— 3-4 —	4-5 5 6
3 3 — —	2 3 3-4 1	— — — —	5 — 4-5 —
— — 3 — —	2 1 4 1 1	— — 4-5 — —	5 — 5 — —
3-4 3-4 2 3 3	4 1 4 2 1	4-5 — — 5 5	5 — 5 4-5 5
Poor Little change — Little duller	Moderate Little duller Little change Little duller	Good Duller — Duller	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
		Salts as pigments	NON-TEXTILE USAGE
		Reaction in sub- stance H <sub>2</sub> SO <sub>4</sub> conc.—dark red	NOTES

**C.I. Acid Red 124—129**

C.I. Acid Red	124	125	126	
CHEMICAL CLASS	—	Disazo	—	
C.I. CONSTITUTION NUMBER	—	—	—	
HUE Daylight Artificial light (tungsten)		Red Little change	Red Little change	
DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres	This C.I. Generic Name is discontinued; dyes formerly listed under it now appear under C.I. Acid Red 114	2  — IV/1 Acetate and cellulose— <i>ss</i>	1, 2  Acetic acid: moderate; neutral: good — Acetate and cellulose— <i>u</i>	
DYEING: OTHER FIBRES		Nylon: acetic acid or neutral Silk: Glauber's salt	Silk: acetic acid or neutral	
PRINTING		Direct on silk and wool	Direct on silk and wool	
FASTNESS PROPERTIES Method		AATCC      ISO	ISO	
Alkali		5	5	3
Carbonising		3	3	5
Chlorination — alteration		—	3-4	5
staining wool		—	5	—
Decatising		3	3-4	4-5
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal		2	2	4-5
normal		3	3	5
2 × normal		3	3	6
Milling, alkaline — alteration		3	2-3	5
staining wool		3	4-5	—
Milling, acid — alteration		—	3-4	5
staining wool		—	3-4	—
Peroxide bleaching — alteration		—	4	5
staining wool		—	3	—
Perspiration		5	4	5
Potting — alteration		—	2	—
staining wool		—	1	—
Sea water — alteration		5	4-5	—
staining wool		5	4-5	—
Stoving		4	3-4	4
Washing — alteration		3	3	4-5
staining wool		3	4	5
OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron		Moderate to good Little duller Little change Duller	Moderate to good Little change Little change Duller	
NON-TEXTILE USAGE				
NOTES				



127	128	129	C.I. Acid Red
Monoazo —	Disazo <b>24125</b>	— —	<b>CHEMICAL CLASS</b> <b>C.I. CONSTITUTION NUMBER</b>
Bright red Little yellower	Yellowish red —	Red Much yellower	<b>HUE</b> Daylight Artificial light (tungsten)
1, 2 — IV/2-3 Acetate—ss, cotton—s, viscose—ss	1, 2 Moderate — Acetate and cellulose—ss	1, 2 Good — Acetate and cellulose—u	<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres
Silk: acid	Silk; weak acid or neutral	Silk: acetic acid	<b>DYEING: OTHER FIBRES</b>
Direct on silk and wool		Direct on silk and wool	<b>PRINTING</b>
ISO 5 1 3 5 4  4-5 5 5-6  3 3 3-4 1  3 1 4 1 1  3-4 2 3 3 2	ISO 3 4-5 4 4 3-4  4-5 5 5-6  — — 4 4-5  3-4 4 4 — —  4-5 4-5 3 4 4	ISO 4-5 4-5 5 5 4-5 (yellower)*  3-4 4-5 5  4-5 4 4-5 3-4  4-5 3 5 (pH 8·0) 4-5 1  5 4-5 5 4-5 (ISO 2) 4-5	<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ - $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Good Little duller Little change Duller	Good Slightly duller — Slightly duller	On wool, good; on silk, moderate 3 (bluer, duller) 2 (bluer, duller) 3-4 yellower	<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron
	See Leather Dyes section	Paper See Leather Dyes section	<b>NON-TEXTILE USAGE</b>
		* Severe	<b>NOTES</b>

**C.I. Acid Red 130—134**

<b>C.I. Acid Red</b>	<b>130</b>	<b>131</b>	<b>131:1</b>
<b>CHEMICAL CLASS</b>	—	Monoazo	—
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Bright bluish red Little change	Bluish red Somewhat yellower	Bluish red —
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	1, 2  Moderate — Acetate and cellulose— <i>u</i>	1, 2  — IV/1 Acetate and cellulose— <i>u</i>	Similar in properties and usage to C.I. Acid Red 131, but slightly different chemically
<b>DYEING: OTHER FIBRES</b>	Silk: acetic acid or neutral	Nylon: acetic acid (heavy dyeings); neutral (light dyeings) Silk: acetic acid or neutral	
<b>PRINTING</b>	Direct on nylon, silk and wool	Direct on nylon, silk, viscose and wool	
<b>FASTNESS PROPERTIES</b> Method	ISO	AATCC	ISO
Alkali	4-5	—	4
Carbonising	4-5	5	4
Chlorination — alteration	5	—	3
staining wool	—	—	5
Decatising	5	5	3-4
Light, $\frac{1}{8}$ — $\frac{1}{2}$ normal	4-5	—	4
normal	5	5	4-5
2 × normal	5-6	—	5
Milling, alkaline — alteration	5	3	2-3
staining wool	—	5	4
Milling, acid — alteration	4	—	3
staining wool	—	—	5
Peroxide bleaching — alteration	5	—	2
staining wool	—	—	3
Perspiration	4-5	4-5	4-5
Potting — alteration	—	—	1
staining wool	—	—	1
Sea water — alteration	4	4-5	4
staining wool	—	4-5	4
Stoving	5	—	3
Washing — alteration	4	4-5	3
staining wool	5	4-5	5
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Moderate to good Slightly duller Little change Slightly duller	Moderate Little bluer Little change Yellower and duller	
<b>NON-TEXTILE USAGE</b>		Paper See Leather Dyes section	
<b>NOTES</b>			

132	133	134	C.I. Acid Red
Disazo —	Monoazo 17995	Disazo 24810	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Dull bluish red Less blue	Bright bluish red→Red Little yellower	Bordeaux Yellower	HUE Daylight Artificial light (tungsten)
2  Poor — Acetate and cellulose— <i>ss</i>	1, 2  — IV/1-2 Acetate and cellulose— <i>u</i>	1, 2  Moderate — Acetate— <i>vss</i> , cellulose— <i>s</i>	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Silk: acetic acid or neutral	Silk: acetic acid or neutral	Nylon: acetic acid or neutral Silk: acetic acid or neutral	DYEING: OTHER FIBRES
Direct on silk, viscose and wool	Direct on silk and wool	Direct on silk, viscose and wool	PRINTING
ISO 4-5 4-5 — — 4  2 3 4  4 — — —  — — 4-5 — — 4 — 3-4 4-5 —	AATCC 2-3 4 2 — 5  4 4-5 5  4 4 — —  2 2-3 4 — — 4 4 4 4	ISO 3-4 4-5 3 4-5  4 4-5 5  2-3 2 4 4  2 4 1 1  4-5 4-5 4 5	FASTNESS PROPERTIES Method Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Good Duller Little change Duller	Moderate to good Little change Little change Little change	Moderate Little bluer and weaker Little change Little bluer and duller	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
See Leather Dyes section	See Leather Dyes section	See Leather Dyes section	NON-TEXTILE USAGE
Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—bluish black	Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—bluish red		NOTES

**C.I. Acid Red 134:1—139**

<b>C.I. Acid Red</b>	<b>134:1</b>	<b>135</b>	<b>136</b>
<b>CHEMICAL CLASS</b>	—	Monoazo	—
<b>C.I. CONSTITUTION NUMBER</b>	—	14695	—
<b>HUE</b> Daylight Artificial light (tungsten)	Bordeaux —	Yellowish red Yellower and brighter	Bluish red —
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	Chemically slightly different from C.I. Acid Red 134, but similar in properties and usage	2, 3  Moderate — Acetate and cellulose— <i>u</i>	2  Moderate — Acetate— <i>ss</i> , cellulose— <i>u</i>
<b>DYEING: OTHER FIBRES</b>		Silk: acetic acid or broken degumming liquor Jute: acid	Silk: broken degumming liquor
<b>PRINTING</b>			
<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool		ISO  3–4 4–5 4 — 4–5  2 3 3–4  1–2 — — —  — — — 2–3 3 —  2 — 2–3 3 —	ISO  4–5 5 — — 4–5  — 5 —  3–4 — — —  — — — 4–5 2 —  5 — — — 3–4 —
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron		Good Little change — Duller	
<b>NON-TEXTILE USAGE</b>		Paper Salts as pigments for printing inks	
<b>NOTES</b>			



137	138	139	C.I. Acid Red
Monoazo 17755	Monoazo 18073	— —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Yellowish red (wool); red (paper) Yellower	Bluish red Yellower	Bluish red Yellower	HUE Daylight Artificial light (tungsten)
2, 3  — — —	2  Poor — Acetate— <i>u</i> , cellulose— <i>ss</i>	1  Poor — Acetate and cellulose — <i>u</i>	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: acetic or formic acid	Silk: acetic acid or ammonium acetate or Glauber's salt		DYEING: OTHER FIBRES
Direct on nylon	Direct on nylon, silk, viscose and wool	Direct on silk and wool	PRINTING
AATCC  3 — — — —  — 5 —  — — — —  — — — — —  — — — — —	ISO*  — 4-5 5 — 4-5 (severe)  3 3-4 4  4-5 4-5 4-5 3-4  4-5 4 5 (pH 8.0) 4-5 1-2  5 5 4 (yellower) 4 (ISO 3) 4-5		FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool  Decatising  Light, $\frac{1}{3}$ – $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
	Poor 3 (duller) 1 (duller) 4-5 (duller)	Poor Little weaker, little duller Little change Duller	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
Paper (main use), soap, synthetic resins See Leather Dyes section	Salts as pigments (for paper coating and nitro-cellulose lacquers)		NON-TEXTILE USAGE
	Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—violet *Fastness properties on nylon (ISO): Light 3-4, 4, 4-5; Perspiration 5; Washing 4 (Staining wool 4-5)		NOTES

**C.I. Acid Red 140—145**

<b>C.I. Acid Red</b>	<b>140</b>	<b>141</b>	<b>142</b>
<b>CHEMICAL CLASS</b>	—	Monoazo	Disazo
<b>C.I. CONSTITUTION NUMBER</b>	—	15625	27000
<b>HUE</b> Daylight Artificial light (tungsten)	Yellowish red Little change	Red Yellower and brighter	Red Little change
<b>DYEING: WOOL</b> Method	2	2	2
Levelling S.D.C. migration test method/grade Staining other fibres	Moderate — Acetate—u, cellulose—ss	— II/1-2 Acetate and cellulose—s	Good — Acetate and cellulose—ss
<b>DYEING: OTHER FIBRES</b>	Silk: acetic acid or neutral	Silk: acetic or sulphuric acid Used for jute	Silk: acetic or sulphuric acid
<b>PRINTING</b>	Direct on silk, viscose and wool Discharge styles on silk and wool*		Direct on nylon, silk and wool
<b>FASTNESS PROPERTIES</b> Method	ISO	ISO	ISO
Alkali	—	3-4	2
Carbonising	4 (weaker, redder)†	4-5	4
Chlorination — alteration	4-5	2	—
staining wool	—	4	—
Decatising	4-5 (severe)	5	5
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	3	2	3
normal	4	2-3	4
2 × normal	4-5	3	4-5
Milling, alkaline — alteration	4	1	3-4
staining wool	4	2	5
Milling, acid — alteration	4	3	3
staining wool	3-4	1	—
Peroxide bleaching — alteration	4 (weaker, brighter)	1	4-5
staining wool	4-5	1	—
Perspiration	4-5 (pH 8.0)	3	2-3
Potting — alteration	5	1	—
staining wool	3	1	—
Sea water — alteration	5	2	—
staining wool	5	3	—
Stoving	4	1	3
Washing — alteration	4 (ISO 2)	2	4
staining wool	5	1	5
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Good Very much duller — Duller	Good Slightly bluer — Slightly duller	Good Slight change — Duller
<b>NON-TEXTILE USAGE</b>	See Leather Dyes section	Paper See Leather Dyes section	
<b>NOTES</b>	*The discharge on wool darkens on exposure †Water rinse		

143	144	145	C.I. Acid Red
— —	Disazo 22900	— 23905	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Bright bluish red Yellower and brighter	Bluish red Unchanged	Bright yellowish red Duller	HUE Daylight Artificial light (tungsten)
1, 2 Moderate — Acetate and cellulose— <i>u</i>	1 — — —	2 Moderate — Acetate and cellulose— <i>u</i>	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: ammonium acetate or sulphate Silk: acetic acid + Glauber's salt or broken degumming liquor		Silk: acetic acid	DYEING: OTHER FIBRES
Direct on nylon, silk and wool Vigoureux process		Direct on silk and wool	PRINTING
ISO  3 * 4-5 4-5 — 4-5  5 6 6-7  4-5 4-5 4-5 4-5  4 3 4-5 3 —  5 — 5 4-5 5		AATCC      ISO  4              4 5              5 4-5           4 —              — 4-5           4-5  4              4-5 4-5           5 5-6           6  3-4           3-4 3-4           2-3 —              — —              —  —              — —              — 4              4-5 —              — —              —  5              5 —              — 4-5           4-5 5              5 5              5	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Poor Little duller Little change Duller		Poor — — —	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
		See Leather Dyes section	NON-TEXTILE USAGE
*Fastness properties on nylon (ISO): Decatising 4-5; Light 4-5, 5-6, 6; Perspiration 5; Rubbing 5; Sea water 5 (Staining wool 5); Washing 5 (Staining wool 5)		Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—dull scarlet	NOTES

**C.I. Acid Red 146—150**

<b>C.I. Acid Red</b>	<b>146</b>	<b>147</b>
<b>CHEMICAL CLASS</b>	—	Azo
<b>C.I. CONSTITUTION NUMBER</b>	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Dull bluish red Duller and yellower	Acetate: bluish red; Nylon: reddish violet Yellower
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	2  Good — Acetate and cellulose—ss	
<b>DYEING: OTHER FIBRES</b>		Acetate and nylon: neutral or weak acid Silk and wool dyed to same depth as acetate; cotton and viscose—ss
<b>PRINTING</b>		Direct and discharge printing of nylon and acetate
<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool	ISO  3–4 1 2 — 2  — 5 —  2 1–2 — —  — — 2–3 — —  2 — 1–2 2–3 3–4	
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Poor — — —	
<b>NON-TEXTILE USAGE</b>		Wooled sheepskins and furs
<b>NOTES</b>		<b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—reddish orange



<b>148</b>	<b>149</b>	<b>150</b>	<b>C.I. Acid Red</b>
Disazo 26665	— —	Disazo 27190	<b>CHEMICAL CLASS</b> <b>C.I. CONSTITUTION NUMBER</b>
Bluish red —	Red Yellower and brighter	Bright red Much yellower	<b>HUE</b> Daylight Artificial light (tungsten)
1, 2 Moderate Acetate and cellulose—ss	1, 2 Moderate Acetate and cellulose—s	2 Moderate Acetate—u, cellulose—ss	<b>DYEING: WOOL</b> Method Levelling S.D.C. migration test method/grade Staining other fibres
	Nylon: acetic acid	Nylon: acetic or formic acid Silk: acetic or formic acid	<b>DYEING: OTHER FIBRES</b>
	Direct on silk and wool		<b>PRINTING</b>
ISO 4 5 — 5  4 4-5 5  4 3 — —  2 — 3 — —  3 — 4 3-4 3	ISO 4-5 5 — — 5  — 4 —  — — 4-5 —  — — 4-5 — —  — — 3 4-5 4	AATCC 1 5 — — —  — 4 —  1 — — —  2 — 1 — —  2-3 — 1 1-2 —	<b>FASTNESS PROPERTIES</b> Method Alkali Carbonising Chlorination — alteration staining wool Decatising Light, $\frac{1}{3}$ - $\frac{1}{2}$ normal normal 2 × normal Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool Sea water — alteration staining wool Stoving Washing — alteration staining wool
Moderate to good Little change —		Good Bluer — Much bluer and duller	<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron
		See Leather Dyes Section	<b>NON-TEXTILE USAGE</b>
			<b>NOTES</b>

# C.I. Acid Red 151—156

C.I. Acid Red	151	152	153
<b>CHEMICAL CLASS</b>	Disazo	Disazo	Azo
<b>C.I. CONSTITUTION NUMBER</b>	26900	23010	—
<b>HUE</b> Daylight Artificial light (tungsten)	Red Little change	Red Slightly yellower	Bluish red→bordeaux —
<b>DYEING: WOOL</b> Method	1, 2	2	1, 2
Levelling	Good	Moderate	—
S.D.C. migration test method/grade	—	—	—
Staining other fibres	Acetate and cellulose—s	Acetate and cellulose—u	—
<b>DYEING: OTHER FIBRES</b>	Nylon: acetic acid or neutral Silk: acetic acid or neutral May be applied to cotton and jute with alum	Silk: acetic acid or neutral, or broken degumming liquor	
<b>PRINTING</b>	Direct on silk and wool	Direct on silk, viscose and wool	
<b>FASTNESS PROPERTIES</b> Method	AATCC	ISO	AATCC
Alkali	3	3	4-5
Carbonising	3	4	5
Chlorination — alteration	—	4	—
staining wool	—	4-5	—
Decatising	3	3	—
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	—	3-4	3
normal	6	4	3-4
2 × normal	—	4-5	4
Milling, alkaline — alteration	2-3	—	3
staining wool	—	—	—
Milling, acid — alteration	—	3-4	—
staining wool	—	2-3	—
Peroxide bleaching — alteration	—	4	2-3
staining wool	—	3-4	—
Perspiration	2-3	4	3
Potting — alteration	—	—	—
staining wool	—	—	—
Sea water — alteration	3	4	3-4
staining wool	3	3-4	—
Stoving	4-5	4	2
Washing — alteration	3	4	3
staining wool	3	3-4	—
<b>OTHER PROPERTIES</b> Dischargeability	Good	Good	
Effect of metals — copper	Slightly bluer	Duller and weaker	
chromium	Little change	Little change	
iron	Somewhat duller	Much weaker	
<b>NON-TEXTILE USAGE</b>	Casein plastics, paper See Leather Dyes section		
<b>NOTES</b>			

154	155	156	C.I. Acid Red
Disazo 24800	Monoazo 18130	Azo —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Bluish red Little change	Bright bluish red Little change	Acetate: dull bluish red* Yellower	HUE Daylight Artificial light (tungsten)
1, 2 Moderate — Acetate— <i>u</i> , cellulose— <i>ss</i>	1, 2 Moderate — Acetate and cellulose— <i>u</i>		DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Silk: broken degumming liquor	Silk: broken degumming liquor	Acetate and nylon: neutral or weak acid Silk and wool Cellulose— <i>ss</i>	DYEING: OTHER FIBRES
Direct on silk and wool	Direct on wool	Direct and discharge styles on acetate and nylon	PRINTING
ISO 3 3-4 — — 4 5 5-6 6 4 — 4-5 — 3 — 3-4 — — 4-5 — 2-3 4 4-5	ISO 3 4 — — 4 4 4-5 3 — 4-5 — 3-4 — 3-4 — — 4-5 — 4 3 3		FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Poor Weaker and duller Little change Weaker and duller	Moderate* Almost unchanged Little change Bluer		OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
Paper Casein plastics See Leather Dyes section		Wooled sheepskins and furs	NON-TEXTILE USAGE
	*Suitable for coloured dis- charge prints	Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—dull bluish red *Nylon: bluer and duller	NOTES

# C.I. Acid Red 157—161

C.I. Acid Red	157	158
CHEMICAL CLASS	Monoazo	Disazo
C.I. CONSTITUTION NUMBER	17990	20530
HUE Daylight Artificial light (tungsten)	Bright red Slightly yellower	Red Somewhat yellower
DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres	1, 2  Moderate — Acetate and cellulose— <i>u</i>	1, 2  — — Acetate and cellulose— <i>u</i>
DYEING: OTHER FIBRES	Silk: broken degumming liquor	Silk: neutral; broken degumming liquor Weighted silk: weakly alkaline phosphate
PRINTING	Direct on wool	Direct on silk and wool
FASTNESS PROPERTIES Method	ISO	ISO
Alkali	3	4
Carbonising	4	5
Chlorination — alteration staining wool	— —	— —
Decatising	4	4
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal	4 5 5-6	4 4 4-5
Milling, alkaline — alteration staining wool	2-3 —	3 —
Milling, acid — alteration staining wool	4 —	4 —
Peroxide bleaching — alteration staining wool	3 —	2-3 —
Perspiration	2-3	3-4
Potting — alteration staining wool	— —	— —
Sea water — alteration staining wool	3-4 —	4 —
Stoving	4	4
Washing — alteration staining wool	3 3	4 3-4
OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron	Poor Duller Little change Duller	Moderate; suitable for coloured discharges Duller Little change Duller and weaker
NON-TEXTILE USAGE		
NOTES		



159	160	161	C.I. Acid Red
Azo —	Monoazo 18150	Monoazo 18035	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Acetate: bright bluish red* Yellower	Bluish red Little redder	Bright bluish red Yellower	HUE Daylight Artificial light (tungsten)
	1, 2  Moderate — Acetate— <i>u</i> , cellulose— <i>ss</i>	1, 2  Moderate — Acetate and cellulose— <i>u</i>	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Acetate and nylon: neutral or weakly acid Silk and wool dyed to same depth as acetate; cellulose— <i>ss</i>	Silk: broken degumming liquor or Na <sub>2</sub> SO <sub>4</sub> Weighted silk: weakly alk- aline Glauber's salt + phos- phate	Silk: acetic acid or neutral	DYEING: OTHER FIBRES
Direct and discharge print- ing of acetate and nylon	Direct on silk and wool		PRINTING
ICI Acetate      Nylon 4-5          — —          — —          — —          — 5-6          3 6          3 6-7          3-4  —          — —          — —          — —          —  —          — —          — 3          5 —          — —          —  —          — —          — —          — 4          5 4          4-5	ISO 5 5 — 5 4 4-5 5 4 — 4-5 — 3-4 — 4-5 — 3-4 — 4-5 — — 5 — 5 4 3-4	ISO 3 4 — — 4-5 4 4-5 5 3 3-4 4 4 4 3 3 4 — — 4-5 4-5 4 3-4 3	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
	Moderate Somewhat duller Little change Somewhat bluer and duller	Poor Little duller Little change Little duller	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
Casein plastics Wooled sheepskins and furs Also as a spirit-soluble dye for spirit-shellac lacquers			NON-TEXTILE USAGE
Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—dull yellow- ish orange  *Nylon: bluer			NOTES

**C.I. Acid Red 162—167**

<b>C.I. Acid Red</b>	<b>162</b>	<b>163</b>	<b>164</b>
<b>CHEMICAL CLASS</b>	Polyazo	Disazo	Disazo
<b>C.I. CONSTITUTION NUMBER</b>	—	24790	23250
<b>HUE</b> Daylight Artificial light (tungsten)	Yellowish red Slightly yellower	Red Little change	Bright yellowish red Slightly yellower
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	1, 2  Moderate — Acetate— <i>u</i> , cellulose— <i>hs</i>	1, 2  Moderate — Acetate— <i>vss</i> , cellulose— <i>ss</i>	1, 2  Moderate — Acetate— <i>ss</i> , cellulose— <i>u</i>
<b>DYEING: OTHER FIBRES</b>		Silk: broken degumming liquor	Silk: broken degumming liquor
<b>PRINTING</b>		Direct on silk and wool	Direct on silk and wool
<b>FASTNESS PROPERTIES</b> Method	AATCC	ISO	ISO
Alkali	—	4	4
Carbonising	—	4	4
Chlorination — alteration staining wool	—	—	—
Decatising	—	5	4
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal	—	4-5	4
normal	5	5	4
2 × normal	—	5-6	4-5
Milling, alkaline — alteration staining wool	—	4	3
Milling, acid — alteration staining wool	—	4-5	4-5
Peroxide bleaching — alteration staining wool	—	3	4
Perspiration	3	4	3-4
Potting — alteration staining wool	—	—	—
Sea water — alteration staining wool	—	4-5	4-5
Stoving	—	3	4-5
Washing — alteration staining wool	3	4	3-4
	—	3-4	3
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron		Good (tends to darken) Duller Little change Bluer and duller	Poor Duller and weaker Little change Duller and weaker
<b>NON-TEXTILE USAGE</b>			Casein and cellulose acetate plastics
<b>NOTES</b>	<b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—bluish violet		

[illegible]

**C.I. Acid Red 167:1—172**

<b>C.I. Acid Red</b>	<b>167:1</b>	<b>168</b>	<b>169</b>
<b>CHEMICAL CLASS</b>	—	—	—
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Bluish red —	Bluish red Yellower	Yellowish red Darker
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	Chemically slightly different from C.I. Acid Red 167, but similar in properties and usage	1, 2  Good (neutral) — Acetate— <i>vss</i> , cellulose— <i>u</i>	1, 2  Good — Acetate and cellulose— <i>s</i>
<b>DYEING: OTHER FIBRES</b>		Silk: acetic acid or neutral	Silk: acetic acid or neutral
<b>PRINTING</b>		Direct on silk and wool	
<b>FASTNESS PROPERTIES</b> Method		AATCC	ISO
Alkali		—	4
Carbonising		4-5	4
Chlorination — alteration		—	—
staining wool		—	—
Decatising		5	5
Light, $\frac{1}{2}$ — normal		—	5-6
normal		5	6
2 × normal		—	6-7
Milling, alkaline — alteration		—	5
staining wool		—	5
Milling, acid — alteration		—	4
staining wool		—	4-5
Peroxide bleaching — alteration		—	5
staining wool		—	—
Perspiration		4-5	4
Potting — alteration		—	3-4
staining wool		—	3
Sea water — alteration		5	4
staining wool		5	5
Stoving		—	5
Washing — alteration		5	5
staining wool		5	5
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron		Moderate to good Little change Little change Slight change	Moderate to good Little change — Slightly duller
<b>NON-TEXTILE USAGE</b>			
<b>NOTES</b>			



170	171	172	C.I. Acid Red
Disazo 27210	Disazo —	Monoazo 18135	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Red* —	Bluish red Yellower	Bluish red Little yellower	HUE Daylight Artificial light (tungsten)
	2  Moderate — Acetate and cellulose— <i>u</i>	2  Good — Acetate and cellulose— <i>u</i>	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
	Silk: acetic acid or neutral	Silk: acetic acid or neutral	DYEING: OTHER FIBRES
	Direct on silk and wool		PRINTING
	ISO 4-5 4-5 — 5  3-4 4 4  4 — —  — — 4-5 — —  4-5 5 4-5 —	AATCC 4 5 — 5  — 5 — 3 — 3 — 4 — 4-5 — 4-5 5 4-5 —	ISO 3 5 5 — 5  4 4-5 5-6  4 — 4 — 5 — 4-5 — 4-5 5 4-5 —
	Good Duller Little change Duller	Moderate Little duller Little change Duller	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
			OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
			NON-TEXTILE USAGE
*Browner on chromed wool	Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—violet		NOTES

**C.I. Acid Red 173—178**

C.I. Acid Red	173	174	175	
CHEMICAL CLASS	Disazo	—	Monoazo	
C.I. CONSTITUTION NUMBER	23290	—	—	
HUE Daylight Artificial light (tungsten)	Yellowish red —	Red Yellower	Bright red Yellower	
DYEING: WOOL Method	1, 2	2	2	
Levelling S.D.C. migration test method/grade Staining other fibres	Good — Acetate and cellulose— <i>ss</i>	Moderate — Acetate and cellulose— <i>u</i>	Good — Acetate— <i>ss</i> , cellulose— <i>hs</i>	
DYEING: OTHER FIBRES	Silk: broken degumming liquor	Silk: acetic acid or neutral		
PRINTING				
FASTNESS PROPERTIES Method	ISO	AATCC	ISO	AATCC
Alkali	4*	—	4	3
Carbonising	4-5	5	4-5	3
Chlorination — alteration	—	—	5	—
staining wool	—	—	—	—
Decatising	4	4-5	5	—
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	3	—	5-6	2
normal	4	5-6	6	3
2 × normal	4	—	6-7	3
Milling, alkaline — alteration	4	—	4	1
staining wool	—	—	5	—
Milling, acid — alteration	—	—	4	—
staining wool	—	—	—	—
Peroxide bleaching — alteration	2	—	5	2
staining wool	—	—	—	—
Perspiration	4	4	5	3
Potting — alteration	—	—	—	—
staining wool	—	—	—	—
Sea water — alteration	4	4-5	4	4
staining wool	—	—	—	—
Stoving	3-4	—	4	—
Washing — alteration	4	5	4-5	1-2
staining wool	4	5	5	—
OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron	Good Unchanged Little change Duller	Good Little change Little change Duller	— Duller — Yellower and duller	
NON-TEXTILE USAGE			Paper See Leather Dyes section	
NOTES	*On silk fastness to light (ISO) is 2	Suitable for use with chrome dyes	Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—scarlet	

176	177	178	C.I. Acid Red
Monoazo 16575	Monoazo 27015	Monoazo (metallised) —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Bluish red* —	Red* —	Bluish red Yellower and brighter	HUE Daylight Artificial light (tungsten)
Acid — — —	1  Moderate — —	1, 2  Moderate — Acetate— <i>u</i> , cellulose— <i>hs</i>	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
		Nylon: neutral or ammonium acetate	DYEING: OTHER FIBRES
		Direct on nylon and wool	PRINTING
ISO Afterchromed 3-4 4-5 — 4 — 6-7 — 1-2 — — — — 4 2-3 — 4-5 — 4-5 4 —		AATCC Wool      Nylon* —      — —      — —      — —      — —      —  —      — 5-6      4-5 —      —  3-4      III 3 —      — —      — —      —  —      — —      — 4-5      4-5 —      — —      —  3      4 —      — 3      II 4 —      —	FASTNESS PROPERTIES Method Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
		Poor Little yellower — Much yellower	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
		See Leather Dyes section	NON-TEXTILE USAGE
Blue to black when afterchromed	*Dark red on chromed wool	Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—red *Fastness to sublimation 5	NOTES

**C.I. Acid Red 179—184**

<b>C.I. Acid Red</b>	<b>179</b>	<b>180</b>	<b>181</b>
<b>CHEMICAL CLASS</b>	Monoazo (metallised)	Monoazo (metallised)	Monoazo
<b>C.I. CONSTITUTION NUMBER</b>	<b>19351</b>	<b>18736</b>	—
<b>HUE</b> Daylight Artificial light (tungsten)	Bluish red Yellower	Red Slightly yellower	Yellowish red Yellower
<b>DYEING: WOOL</b> Method	3	3	3
Levelling S.D.C. migration test method/grade Staining other fibres	Good; may be salted at boil — Acetate—u, cellulose—ss	Good — Acetate and cellulose—ss	Good — Acetate and cellulose—u
<b>DYEING: OTHER FIBRES</b>	Nylon: formic acid Silk: acetic, formic or sulphuric acid	Nylon: formic or sulphuric acid Silk: acetic, formic or sulphuric acid or broken degumming liquor	Nylon: sulphuric acid Silk: sulphuric acid
<b>PRINTING</b>	Direct on silk and wool Ground for white discharge effects	Direct on silk and wool Discharge styles on wool	Direct on wool
<b>FASTNESS PROPERTIES</b> Method	AATCC*      ISO	AATCC*      ISO	ISO
Alkali	4                  4	3-4              4	5
Carbonising	5                  3-4	3                  4	5
Chlorination — alteration	—                  4	—                  4	—
staining wool	—                  —	—                  —	—
Decatising	5                  4	4                  4-5	5
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal	5                  5	5-6              6	4
normal	6                  5-6	6                  6	4-5
2 × normal	7                  6-7	7                  6-7	5
Milling, alkaline — alteration	2-3              3-4	3-4              3-4	2-3
staining wool	—                  —	—                  —	—
Milling, acid — alteration	—                  2	—                  3	—
staining wool	—                  —	—                  —	—
Peroxide bleaching — alteration	1                  1-2	3                  3	—
staining wool	—                  —	—                  —	—
Perspiration	3                  5	4-5              5	—
Potting — alteration	—                  3	—                  3	—
staining wool	—                  —	—                  —	—
Sea water — alteration	4                  3-4	3-4              4	3-4
staining wool	—                  —	—                  —	—
Stoving	4                  4	4                  4-5	5
Washing — alteration	2                  4	3                  3-4	3-4
staining wool	2                  3-4	3                  4	—
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Good Trace duller Little change Weaker and duller	Good Yellower — Weaker and duller	Good Duller — Duller
<b>NON-TEXTILE USAGE</b>	Anodised aluminium Paper See Leather Dyes section	Anodised aluminium See Leather Dyes section See C.I. Solvent Orange 6	
<b>NOTES</b>	*On silk the fastness to washing, milling and perspiration is lower than on wool but may be improved by after-treatment with tannin and tartar emetic. Fastness properties on nylon (AATCC): Light 5; Milling (alkaline) 1; Perspiration 4-5; Washing 1	*On silk the fastness to milling, perspiration and washing is lower than on wool; wet fastness properties are improved by after-treatment with tannin and tartar emetic	<b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—scarlet



182	183	184	C.I. Acid Red
Monoazo (metallised) —	Monoazo (metallised) 18800	Monoazo (metallised) 15685	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Dull bluish red Yellower	Yellowish red Slightly yellower	Bordeaux Much yellower and brighter	HUE Daylight Artificial light (tungsten)
1, 2 Moderate — Acetate and cellulose—ss	3 Good; may be salted at boil — Acetate and cellulose—u	3 Good — Acetate and cellulose—ss	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: ammonium acetate	Nylon: formic acid Silk: broken degumming liquor	Nylon: formic acid Silk: acetic or formic acid, or broken degumming liquor	DYEING: OTHER FIBRES
Direct on nylon and wool	Direct on silk and wool	Direct on silk and wool	PRINTING
<div> <div>AATCC</div> <div> <div>Wool</div> <div> <div>—</div> <div>—</div> <div>—</div> <div>—</div> <div>—</div> <div>6-7</div> <div>3-4</div> <div>—</div> <div>—</div> <div>5</div> <div>—</div> <div>4</div> <div>—</div> <div>3</div> <div>—</div> </div> </div> <div> <div>Nylon*</div> <div> <div>—</div> <div>—</div> <div>—</div> <div>—</div> <div>—</div> <div>7-8</div> <div>III 4</div> <div>—</div> <div>—</div> <div>3-4</div> <div>4-5</div> <div>—</div> <div>4-5</div> <div>—</div> <div>II 4</div> <div>—</div> </div> </div> </div>	<div> <div>AATCC</div> <div> <div>3</div> <div>5</div> <div>—</div> <div>5</div> <div>6</div> <div>6-7</div> <div>3</div> <div>—</div> <div>—</div> <div>5</div> <div>—</div> <div>5</div> <div>—</div> <div>2</div> <div>2</div> </div> </div> <div> <div>ISO</div> <div> <div>3</div> <div>4</div> <div>3-4</div> <div>—</div> <div>4-5</div> <div>6-7</div> <div>3-4</div> <div>—</div> <div>2</div> <div>—</div> <div>4</div> <div>3</div> <div>—</div> <div>3-4</div> <div>4</div> </div> </div>	<div> <div>AATCC</div> <div> <div>3</div> <div>5</div> <div>—</div> <div>5</div> <div>—</div> <div>4-5</div> <div>2</div> <div>—</div> <div>—</div> <div>5</div> <div>—</div> <div>4</div> <div>—</div> <div>5</div> <div>—</div> </div> </div> <div> <div>ISO</div> <div> <div>4</div> <div>4-5</div> <div>4</div> <div>—</div> <div>4</div> <div>5</div> <div>4</div> <div>3-4</div> <div>1</div> <div>—</div> <div>5</div> <div>3</div> <div>—</div> <div>3-4</div> <div>4</div> </div> </div>	<div>FASTNESS PROPERTIES</div> <div>Method</div> <div>Alkali</div> <div>Carbonising</div> <div>Chlorination — alteration staining wool</div> <div>Decatising</div> <div>Light, <math>\frac{1}{3}</math>—<math>\frac{1}{2}</math> normal normal 2 × normal</div> <div>Milling, alkaline — alteration staining wool</div> <div>Milling, acid — alteration staining wool</div> <div>Peroxide bleaching — alteration staining wool</div> <div>Perspiration</div> <div>Potting — alteration staining wool</div> <div>Sea water — alteration staining wool</div> <div>Stoving</div> <div>Washing — alteration staining wool</div>
(On nylon) moderate Little yellower — Much yellower	Moderate to good Slightly weaker — Weaker and duller	Good Bluer Little change Bluer and weaker	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
See Leather Dyes section	See Leather Dyes section	Anodised aluminium Pigments (heavy metal salts) See Leather Dyes section	NON-TEXTILE USAGE
Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—reddish violet *Fastness to sublimation 5		Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—purple	NOTES

**C.I. Acid Red 185—190**

C.I. Acid Red	185	186	187		
CHEMICAL CLASS	—	Monoazo (metallised)	Monoazo (metallised)		
C.I. CONSTITUTION NUMBER	—	18810	16265		
HUE Daylight Artificial light (tungsten)	Bright red —	Bluish pink Slightly yellower	Bluish red Yellower		
DYEING: WOOL Method	1, 2	3	3		
Levelling S.D.C. migration test method/grade Staining other fibres	— — Acetate and cellulose— <i>u</i>	Good — Acetate and cellulose— <i>u</i>	Good — Acetate and cellulose— <i>u</i>		
DYEING: OTHER FIBRES	Silk: broken degumming liquor	Nylon: formic acid Silk: acetic acid and Glauber's salt	Nylon: formic acid Silk: sulphuric or acetic acid		
PRINTING		Direct on silk and wool	Direct on wool White discharge effects		
FASTNESS PROPERTIES Method	ISO	AATCC	ISO	AATCC	ISO
Alkali	4	3-4	4	4	4
Carbonising	5	5	4-5	4-5	4
Chlorination — alteration	—	—	4	—	5
staining wool	—	—	—	—	—
Decatising	4-5	4	4-5	4	4
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	6	—	4-5	—	6
normal	6	6	5-6	5-6	6-7
2 × normal	6	—	6	—	7
Milling, alkaline — alteration	3-4	3-4	4	3-4	4
staining wool	—	—	—	—	—
Milling, acid — alteration	—	—	4	—	3-4
staining wool	—	—	—	—	—
Peroxide bleaching — alteration	—	2	2	1	2
staining wool	—	—	—	—	—
Perspiration	4	3	4	4	4
Potting — alteration	—	—	3	—	2-3
staining wool	—	—	—	—	—
Sea water — alteration	4	3	4	4	3-4
staining wool	—	—	—	—	—
Stoving	—	4-5	4-5	3	4
Washing — alteration	4	3-4	4-5	3-4	3-4
staining wool	—	—	—	—	—
OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron	Good — — —	Poor Little duller Little change Little duller		Good Little duller Little change Much weaker	
NON-TEXTILE USAGE		See Leather Dyes section		See Leather Dyes section	
NOTES					



# C.I. Acid Red 191—196

C.I. Acid Red	191	192	193	
CHEMICAL CLASS	Monoazo (metallised)	—	—	
C.I. CONSTITUTION NUMBER	—	—	—	
HUE Daylight Artificial light (tungsten)	Bright bluish red (pink) Yellower	Red Little change	Bordeaux —	
DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres	3  Good — Acetate and cellulose—u	3  Good — Acetate and cellulose—u		
DYEING: OTHER FIBRES	Nylon: formic acid Silk: acetic or formic acid + Glauber's salt	Nylon: formic or sulphuric acid	Silk	
PRINTING	Direct on silk and wool	Direct on silk and wool		
FASTNESS PROPERTIES Method	AATCC	ISO	AATCC	ISO
Alkali	1	3	4-5	4
Carbonising	5	4-5	5	4-5
Chlorination — alteration	—	—	—	—
staining wool	—	—	—	—
Decatising	5	4-5	5	4-5
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	4	4-5	5	5-6
normal	5	5	5-6	6
2 × normal	6	6	6	6-7
Milling, alkaline — alteration	3	3-4	5	4
staining wool	—	—	—	—
Milling, acid — alteration	—	—	—	—
staining wool	—	—	—	—
Peroxide bleaching — alteration	1	2	—	1
staining wool	—	—	—	—
Perspiration	5	4-5	5	4-5
Potting — alteration	2-3	—	—	4
staining wool	—	—	—	—
Sea water — alteration	5	4	5	4
staining wool	—	—	—	—
Stoving	5	4-5	5	4-5
Washing — alteration	3	4	5	4
staining wool	—	—	—	—
OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron	Moderate Slightly weaker — Duller		Poor Little change Little change Bluer	
NON-TEXTILE USAGE	Urea-formaldehyde resins See Leather Dyes section	See Leather Dyes section	See Leather Dyes section	
NOTES	Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—brownish orange	Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—brownish yellow		



194	195	196	C.I. Acid Red
Monoazo (metallised) —	Monoazo (metallised) —	— —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Bluish red Yellower	Bluish red Slightly yellower and brighter	Red —	HUE Daylight Artificial light (tungsten)
3  Good — Acetate and cellulose—u	3  Good; may be salted at boil —		DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
	Silk; acid + Glauber's salt		DYEING: OTHER FIBRES
Direct on wool	Direct on silk and wool		PRINTING
AATCC 4 5 — 5  5 6 7  4 4 — —  4-5 — — —  5 — 5 3-4 3-4	ISO 4 5 5 — 5  5-6 6 6-7  4 5 4 4-5  2 4-5 4-5 3-4 2-3  — — 5 3-4 5	ISO 4-5 4-5 4 — 5  5-6 6  3-4 5 4-5 4  1 — 5 —  5 — 5 4 5	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Poor Considerable change — Moderate change	Poor Slight change — Duller		OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
See Leather Dyes section	See Leather Dyes section	See Leather Dyes section	NON-TEXTILE USAGE
			NOTES

C.I. Acid Red	197	198	199
CHEMICAL CLASS	Monoazo (metallised)	Monoazo (metallised)	—
C.I. CONSTITUTION NUMBER	—	19115	—
HUE Daylight Artificial light (tungsten)	Bluish pink —	Red Slightly yellower	Bright bluish red —
DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres	3  Good — Acetate— <i>u</i> , cellulose— <i>ss</i>	3  Good — Acetate and cellulose— <i>u</i>	
DYEING: OTHER FIBRES	Nylon: formic acid	Silk: broken degumming liquor	
PRINTING	Direct on nylon	Direct on wool	
FASTNESS PROPERTIES Method	AATCC		ISO
	Wool	Nylon*	
Alkali	3	—	3-4
Carbonising	4	—	4-5
Chlorination — alteration	—	—	4
staining wool	—	—	—
Decatising	—	—	4-5
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	3	4	6
normal	4	4-5	6-7
2 × normal	5	5	6-7
Milling, alkaline — alteration	4	2	4
staining wool	—	—	—
Milling, acid — alteration	—	—	3
staining wool	—	—	—
Peroxide bleaching — alteration	1	1	3-4
staining wool	—	—	—
Perspiration	3-4	2	3-4
Potting — alteration	—	—	3
staining wool	—	—	—
Sea water — alteration	3	—	4
staining wool	5	—	—
Stoving	—	—	4-5
Washing — alteration	4	3-4	4-5
staining wool	—	—	4-5
OTHER PROPERTIES			
Dischargeability	On nylon: moderate to good	Poor	
Effect of metals — copper	Unchanged	Little change	
chromium	—	—	
iron	Unchanged	Duller and yellower	
NON-TEXTILE USAGE	Soap See Leather Dyes section	Anodised aluminium See Leather Dyes section	See Leather Dyes section
NOTES	Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—reddish violet *Sublimation 2-3 (Staining 5)		

200	201	202	C.I. Acid Red
Monoazo (metallised) —	Monoazo (metallised) <b>18761</b>	— —	<b>CHEMICAL CLASS</b> <b>C.I. CONSTITUTION NUMBER</b>
Bluish red Little change	Bluish pink Less bluish	Bluish red —	<b>HUE</b> Daylight Artificial light (tungsten)
3  Good; suitable for salting at boil Acetate and cellulose— <i>u</i>	3  Good; may be salted at boil Acetate— <i>u</i> , cellulose— <i>ss</i>		<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres
	Silk: acetic acid		<b>DYEING: OTHER FIBRES</b>
	Direct on silk and wool		<b>PRINTING</b>
ISO  4 4 5 — 5  5-6 6 6-7  3 4-5 4 3  2 4-5 4-5 3 2  — — 5 4-5 5	ISO  2-3 4-5 3-4 — 4-5  4 4-5 5-6  4 — 2-3 —  2-3 — 5 4 —  5 — 5 4-5 —		<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool  Decatising  Light, $\frac{1}{3}$ - $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool  Perspiration Potting — alteration staining wool  Sea water — alteration staining wool  Stoving Washing — alteration staining wool
Poor Considerable change — Moderate change	Poor Yellower and duller Little change Duller		<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron
		See Leather Dyes section	<b>NON-TEXTILE USAGE</b>
			<b>NOTES</b>

**C.I. Acid Red 203—208**

<b>C.I. Acid Red</b>	<b>203</b>	<b>204</b>	<b>205</b>
<b>CHEMICAL CLASS</b>	Azo (metallised)	Monoazo (metallised)	—
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Yellowish red Yellower	Dull bluish red —	Bluish red —
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	3  Good — Acetate and viscose— <i>u</i> , cotton— <i>ss</i>	3  Poor — Acetate— <i>u</i> , cellulose— <i>ss</i>	
<b>DYEING: OTHER FIBRES</b>		Silk: acetic acid or neutral	Silk
<b>PRINTING</b>		Direct on silk and wool	
<b>FASTNESS PROPERTIES</b> Method	ISO	ISO	
Alkali	5	4	
Carbonising	4-5	3-4	
Chlorination — alteration	—	—	
staining wool	—	—	
Decatising	4	5	
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal	7	4-5	
normal	7	5	
2 × normal	7-8	5-6	
Milling, alkaline — alteration	4	3-4	
staining wool	4	—	
Milling, acid — alteration	—	—	
staining wool	—	—	
Peroxide bleaching — alteration	—	—	
staining wool	—	—	
Perspiration	5	4	
Potting — alteration	—	3-4	
staining wool	—	—	
Sea water — alteration	5	4-5	
staining wool	4	—	
Stoving	4-5	4-5	
Washing — alteration	4	4	
staining wool	5	—	
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Moderate — — —	Moderate Unchanged Little change Slight change	
<b>NON-TEXTILE USAGE</b>		Leather: vegetable, chrome and semi-chrome tannages	Leather: vegetable, chrome and semi-chrome tannages. Bookbinding, gloving, shoe-upper, suède and upholstery leather. Brush staining.
<b>NOTES</b>		<b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—bordeaux	On chrome-tanned leather: Light fastness 5; Penetration 4





**C.I. Acid Red 209—212**

<b>C.I. Acid Red</b>	<b>209</b>	<b>210</b>
<b>CHEMICAL CLASS</b>	Monoazo (1:2 metal complex)	Monoazo (metallised)
<b>C.I. CONSTITUTION NUMBER</b>	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Yellowish red Somewhat yellower	Yellowish red —
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	1, 2  Migration poor; initial strike level — Acetate—s, cellulose—ss	3  Good — Acetate and cellulose—ss
<b>DYEING: OTHER FIBRES</b>	Nylon: aqueous bath; ammonium acetate added for exhaustion Silk: neutral or acetic acid	Silk: acetic acid
<b>PRINTING</b>	Direct on nylon, silk and wool Vigoureux printing of wool slubbing	Direct on silk and wool
<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{8}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool	ISO  5 4-5 4-5 5 5  5 6 6-7  4-5 5 4 4  4 5 5 5 2  5 5 4-5 5 5 5	ISO  4 4 — — 5  6 6 6-7  4 — — —  — — 4-5 3 —  4-5 — 4 4 —
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Good Unaffected Little change Slight change	Good Duller Little change Duller
<b>NON-TEXTILE USAGE</b>	See Leather Dyes section	Leather: on vegetable, chrome and semi-chrome tannages
<b>NOTES</b>		<b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—brownish yellow

211	211:1	212	C.I. Acid Red
Monoazo (1:2 metal complex) —	— —	Monoazo (metallised) —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Red Somewhat yellower		Red Little yellower	HUE Daylight Artificial light (tungsten)
1, 2 Migration poor; initial strike level — Acetate—s, cellulose—ss	Slightly different chemically and in hue from C.I. Acid Red 211 but similar to it in other respects	3 Good — Acetate and cellulose —u	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: neutral Silk: acetic acid or neutral			DYEING: OTHER FIBRES
Direct on nylon, silk, viscose and wool Vigoureux printing		Direct on silk, viscose and wool	PRINTING
ISO 5 4-5 3-4 5 5  5 6 6-7  4-5 4-5 3-4 4  4 4-5 4-5 4 2  4-5 5 4-5 4-5 5		AATCC      ISO 4              4 5              4 —             3-4 —             — 5              4-5  5              5 5-6          5-6 6              6  4              3-4 —              — —              4 —              2-3  —              2 —              — 4-5          4-5 —              4 —              2  5              4-5 —              — 4-5          4-5 4              4-5 —              —	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Good — Little change —		Good Bluer and duller — Much weaker	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
See Leather Dyes section		Anodised aluminium, pigments (heavy metal salts) See Leather Dyes section	NON-TEXTILE USAGE
			NOTES

# C.I. Acid Red 212:1—216

C.I. Acid Red	212:1	213	213:1
<b>CHEMICAL CLASS</b>	—	—	—
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)		Bluish red Yellower	
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	Similar to C.I. Acid Red 212	1, 2-  Migration poor; initial strike level — Acetate—s, cellulose—ss	Slightly different chemically from C.I. Acid Red 213 but similar to it in hue, properties and usage
<b>DYEING: OTHER FIBRES</b>		Nylon: neutral Silk: acetic acid or neutral	
<b>PRINTING</b>		Direct on nylon, silk, viscose and wool Vigoureux printing	
<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool		ISO  5 4-5 3-4 5 5  6-7 7 7-8  4-5 5 4 4  3-4 5 5 3-4 3-4  5 5 5 5 5	
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron		Poor Unaffected Little change Slightly duller	
<b>NON-TEXTILE USAGE</b>		See Leather Dyes section	
<b>NOTES</b>			



214	215	216	C.I. Acid Red
Monoazo (metallised) 19355	— —	— —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Red Somewhat yellower	Bluish red Yellower	Dull red Yellower	HUE Daylight Artificial light (tungsten)
3 Good; may be salted at boil — Acetate and cellulose— <i>u</i>	1, 2 Moderate (migration) — Acetate and cotton— <i>ss</i> , vis- cose— <i>u</i>	1, 2 Moderate (migration) — Acetate and viscose— <i>u</i> , cotton— <i>ss</i>	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Silk: broken degumming liquor	Nylon: as wool* Silk: broken degumming liquor, or Glauber's salt + ammonium sulphate or acet- ate	Nylon: as wool* Silk: broken degumming liquor, or Glauber's salt + ammonium sulphate or acetate	DYEING: OTHER FIBRES
Direct on wool	Direct on nylon, silk, viscose and wool Vigoureux printing	Direct on nylon, silk, vis- cose and wool Vigoureux printing	PRINTING
ISO*	ISO	ISO Wool      Nylon	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Poor — Little change Little change Duller	Good — Little change —	Good — Little change —	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
See Leather Dyes section	See Leather Dyes section	See Leather Dyes section	NON-TEXTILE USAGE
*Fastness properties on silk are improved by aftertreat- ment with tannin and tartar emetic	*Often with addition of a retarding agent	*Often with addition of a retarding agent	NOTES

**C.I. Acid Red 217—220**

<b>C.I. Acid Red</b>	<b>217</b>	<b>218</b>
<b>CHEMICAL CLASS</b>	—	—
<b>C.I. CONSTITUTION NUMBER</b>	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Bordeaux Duller and yellower	Bluish red Much yellower and brighter
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	1, 2  Moderate (migration) — Acetate—s, cotton—ss, viscose—u	1, 2  Migration poor; initial strike level — Acetate and cellulose—ss
<b>DYEING: OTHER FIBRES</b>	Nylon: as wool, often with addition of a retarding agent Silk: broken degumming liquor, or Glau- ber's salt + ammonium sulphate or acetate	Nylon: neutral or slightly alkaline Silk: neutral or weakly acid
<b>PRINTING</b>	Direct on nylon, silk, viscose and wool Vigoureux printing	Direct on nylon, silk, viscose and wool Vigoureux printing
<b>FASTNESS PROPERTIES</b> Method	<div>ISO</div> <div>Wool                      Nylon</div>	
Alkali	5	5
Carbonising	5	5
Chlorination — alteration	5	4
staining wool	—	—
Decatising	5	5
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	6-7	7
normal	7	7-8
2 × normal	7-8	8
Milling, alkaline — alteration	4-5	5
staining wool	5	5
Milling, acid — alteration	—	—
staining wool	—	—
Peroxide bleaching — alteration	—	—
staining wool	—	—
Perspiration	5	5
Potting — alteration	—	—
staining wool	—	—
Sea water — alteration	5	5
staining wool	4-5	5
Stoving	4-5	5
Washing — alteration	4-5	5
staining wool	5	5
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Moderate — Little change —	Moderate Unaffected Little effect Much duller
<b>NON-TEXTILE USAGE</b>	See Leather Dyes section	
<b>NOTES</b>		

219	220	C.I. Acid Red
— —	— —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Red Much yellower	Yellowish red Yellower	HUE Daylight Artificial light (tungsten)
1, 2 Migration poor; initial strike level — Acetate—ss, cotton—s, viscose—s	1, 2 Migration poor; initial strike level — Acetate and cotton—s, viscose—ss	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: neutral or slightly alkaline Silk: neutral or weakly acid	Nylon: neutral or slightly alkaline Silk: neutral or weakly acid	DYEING: OTHER FIBRES
Direct on nylon, silk, viscose and wool Vigoureux printing	Direct on nylon, silk, viscose and wool Vigoureux printing	PRINTING
ISO 4-5 4-5 4 — 4-5  5-6 6 6-7  4-5 5 3-4 —  — — 5 3 —  4-5 5 3-4 4-5 5	ISO 5 5 4 — 4-5  5-6 5-6 6  5 5 3-4 —  — — 5 3-4 —  5 5 4 5 5	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Moderate Unaffected Little change Slightly duller	Moderate to good Unaffected Little change Slightly duller	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
		NON-TEXTILE USAGE
		NOTES

# C.I. Acid Red 221—226

C.I. Acid Red	221	222	223
<b>CHEMICAL CLASS</b>	Azo (metallised)	—	Monoazo (metallised)
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Red Yellower		
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	1, 2  Good — —		
<b>DYEING: OTHER FIBRES</b>	Nylon: ammonium acetate + levelling agent Silk: acetic acid or neutral		
<b>PRINTING</b>	Direct on nylon, silk and wool Vigoureux printing		
<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool	ISO  5 3–4 4 4–5 5  6 6 6–7  4–5 5 3 2  4–5 3–4 5 3 1–2  5 5 3–4 5 5		
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Poor — Little change —		
<b>NON-TEXTILE USAGE</b>		Leather: on vegetable, chrome and semi-chrome tannages	See Leather Dyes section
<b>NOTES</b>		On chrome-tanned leather: Light fastness 5, Solubility 4 (SDC)	<b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—yellow



224	225	226	C.I. Acid Red
— —	— —	— —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
	Bluish red Slightly duller	Red Slightly duller	HUE Daylight Artificial light (tungsten)
This C.I. Generic Name is discontinued. The dyes formerly listed under it now appear under C.I. Acid Red 120	— — Cellulose— <i>ss</i>	— — Cellulose— <i>ss</i> , silk— <i>hs</i>	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
	Nylon: ammonia+levelling agent; ammonium sulphate added for exhaustion	Nylon: ammonia+levelling agent; ammonium sulphate added for exhaustion	DYEING: OTHER FIBRES
	Direct on nylon	Direct on nylon	PRINTING
	ISO Nylon 6 5 5 4-5* — 4-5  5-6 6 6-7  5 5 4-5 —  3 — 5 3-4 2-3  5 5 5 4-5 4-5	ISO Nylon 6 5 5 4-5* — 4-5  5-6 6 6-7  4-5 3 5 5  2-3 — 5 3-4 2-3  5 5 5 4-5 4-5	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water -- alteration staining wool Stoving Washing — alteration staining wool
	Poor Unchanged — Unchanged	Moderate to poor Unchanged — Unchanged	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
			NON-TEXTILE USAGE
	*Chlorinated water	*Chlorinated water	NOTES

**C.I. Acid Red 227—232**

<b>C.I. Acid Red</b>	<b>227</b>	<b>228</b>	<b>229</b>
<b>CHEMICAL CLASS</b>	—	Azo	Monoazo
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Yellowish red Slightly bluer	Bluish red Slightly yellower	Red (leather) —
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	—  — Cellulose— <i>ss</i> , silk— <i>hs</i>	—  — Cellulose— <i>ss</i> , silk— <i>hs</i>	
<b>DYEING: OTHER FIBRES</b>	Nylon: ammonia + levelling agent; ammonium sulphate added for exhaustion	Nylon: ammonia + levelling agent; ammonium sulphate added for exhaustion	
<b>PRINTING</b>	Direct on nylon	Direct on nylon	
<b>FASTNESS PROPERTIES</b> Method	ISO	ISO	
Alkali	5	5	
Carbonising	5	5	
Chlorination — alteration	5	5	
staining wool	—	—	
Decatising	4-5	4-5	
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal	6-7	7	
normal	7	7-8	
2 × normal	7-8	8	
Milling, alkaline — alteration	5	5	
staining wool	5	5	
Milling, acid — alteration	4	4-5	
staining wool	5	5	
Peroxide bleaching — alteration	4	4-5	
staining wool	—	—	
Perspiration	5	5	
Potting — alteration	4-5	4-5	
staining wool	3	4	
Sea water — alteration	5	5	
staining wool	5	5	
Stoving	5	5	
Washing — alteration	5	5	
staining wool	5	5	
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Good Slightly changed — Slightly changed	Good Unchanged — Unchanged	
<b>NON-TEXTILE USAGE</b>			See Leather Dyes section Paper (hue: bright yellowish red)
<b>NOTES</b>			

230	231	232	C.I. Acid Red
— —	Monoazo <b>17040</b>	— —	<b>CHEMICAL CLASS</b> <b>C.I. CONSTITUTION NUMBER</b>
Yellowish red —	Dull bluish red —		<b>HUE</b> Daylight Artificial light (tungsten)
		This C.I. Generic Name is discontinued. The dyes formerly listed under it now appear under C.I. Acid Red 97	<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres
Silk			<b>DYEING: OTHER FIBRES</b>
			<b>PRINTING</b>
			<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{8}$ – $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
			<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron
Leather: vegetable, chrome and semi-chrome tannages. Bookbinding, gloving, shoe-upper, suède and upholstery leathers. Brush staining.	See Leather Dyes section		<b>NON-TEXTILE USAGE</b>
On chrome-tanned leather: Light fastness 1; Penetration 1; Solubility (SDC) 3			<b>NOTES</b>

**C.I. Acid Red 233—240**

<b>C.I. Acid Red</b>	<b>233</b>	<b>234, 235 and 236</b>	<b>237</b>
<b>CHEMICAL CLASS</b>	—	—	Monoazo
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Red —		Bordeaux —
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres			
<b>DYEING: OTHER FIBRES</b>			
<b>PRINTING</b>			
<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool			
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron			
<b>NON-TEXTILE USAGE</b>	Leather: on vegetable, chrome and semi-chrome tannages.	Leather: on vegetable, chrome and semi-chrome tannages. CI Acid Reds 234 and 235: see Leather Dyes section	See Leather Dyes section
<b>NOTES</b>	On chrome-tanned leather (ISO): Light fastness 3; Penetration 5; Solubility 5	CI Acid Red 236: on chrome- tanned leather, Light fastness 3; Penetration 2 (ISO)	<b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—blue



238	239	240	C.I. Acid Red
— —	Monoazo —	Monoazo —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Red —	Bright red Yellower	Bright yellowish red Yellower	HUE Daylight Artificial light (tungsten)
	2  Poor Acetate and cellulose— <i>u</i>	3  Good; may be salted at boil Acetate— <i>u</i> , cellulose— <i>ss</i>	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
	Silk: neutral		DYEING: OTHER FIBRES
	Direct on silk and wool		PRINTING
	ISO  3 4-5 5 4 4  4 4-5 5-6  4 4-5 — —  3-4 3 5 3-4 2  5 5 4-5 4 5	ISO  3 3-4 3 5 4  — 5 6  1 2 3-4 1  4 3-4 3-4 3 2  4 2 3-4 3 5	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool  Decatising  Light, $\frac{1}{8}$ - $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
	— Little duller — Duller	— 4 (duller) — 4-5	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
Leather: on vegetable, chrome and semi-chrome tannages			NON-TEXTILE USAGE
			NOTES

**C.I. Acid Red 241—246**

<b>C.I. Acid Red</b>	<b>241</b>	<b>242</b>	<b>243</b>
<b>CHEMICAL CLASS</b>	Disazo	Monoazo	Monoazo (metal complex)
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Bright bluish red —	Bright red Yellower	Bright red Unaltered
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres		3  Good Acetate, cellulose and polyester— <i>u</i>	1  Migration poor; initial strike level Acetate and cotton— <i>vss</i>
<b>DYEING: OTHER FIBRES</b>			Nylon: neutral to slightly alkaline Silk: neutral or acetic acid
<b>PRINTING</b>			
<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool		ISO  4 4-5 — — 4-5  4 4-5 5  3-4 4 4 2-3  3-4 — 5 — —  4 4-5 5 2 3-4	ISO  3-4 4-5 4 — 4  5 5-6 6  4 — 5 — —  — — 5 1 —  5 — 4 4 —
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron		Good Affected — Slightly affected	— Slightly affected Moderately affected Very slightly affected
<b>NON-TEXTILE USAGE</b>	See Leather Dyes section		
<b>NOTES</b>			

244	245	246	C.I. Acid Red
Monoazo (1:2 metal complex) —	— —	— —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Red Unchanged		Bluish red Slightly yellower	HUE Daylight Artificial light (tungsten)
1, 2  Migration poor; initial strike level — Acetate and cellulose—ss	This C.I. Generic Name is discontinued	1, 2  Migration poor; initial strike level — Acetate—ss, cellulose—s	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: neutral or slightly alkaline Silk: slightly acid		Nylon: slightly alkaline Silk: acetic acid	DYEING: OTHER FIBRES
Direct on nylon, silk and wool			PRINTING
ISO  4-5 5 5 5 4  6 6 6-7  5 4-5 3 3  — — 5 3 2  5 5 4 4-5 5		ISO  5 5 — — 5  5-6 6 7  4-5 4-5 4-5 3-4  — — 5 4-5 2  5 5 4-5 5 4-5	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{8}$ - $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
		— Little weaker — Little yellower	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
			NON-TEXTILE USAGE
			NOTES

# C.I. Acid Red 247—252

C.I. Acid Red	247	248	249
<b>CHEMICAL CLASS</b>	—	—	Monoazo
<b>C.I. CONSTITUTION NUMBER</b>	—	—	18134
<b>HUE</b> Daylight Artificial light (tungsten)	Yellowish red Yellower	Bluish red —	Bright bluish red Yellower
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	1, 2  Migration poor; initial strike level — Acetate and cellulose—ss		1, 2  Poor; unsuitable for salting at boil — Acetate and cellulose—u
<b>DYEING: OTHER FIBRES</b>	Nylon: slightly alkaline Silk: acetic acid		Nylon and silk: neutral or slightly acid
<b>PRINTING</b>			Direct on silk and wool
<b>FASTNESS PROPERTIES</b> Method	ISO		AATCC      ISO
Alkali	3		2*      2-3
Carbonising	5		5      4
Chlorination — alteration	—		—      3-4
staining wool	—		—      4
Decatising	5		—      4
Light, $\frac{1}{8}$ — $\frac{1}{2}$ normal	5		—      4
normal	5-6		3      5
2× normal	6-7		—      5-6
Milling, alkaline — alteration	5		4      3-4
staining wool	5		3      3
Milling, acid — alteration	4-5		—      3-4
staining wool	5		—      3-4
Peroxide bleaching — alteration	—		4      4
staining wool	—		2      3
Perspiration	5		—      4
Potting — alteration	3-4		—      2
staining wool	2		—      2
Sea water — alteration	5		—      4
staining wool	5		—      4-5
Stoving	—		—      4
Washing — alteration	5		—      2
staining wool	5		—      3
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron			Good Slightly bluer Little change Somewhat duller
<b>NON-TEXTILE USAGE</b>		See Leather Dyes section	
<b>NOTES</b>			*Fastness on nylon (ISO): Light 4; Water 4; Milling (alkaline) 4 (4-5); Perspira- tion 4; Sea water 4; Washing 4-5





**C.I. Acid Red 253—258**

<b>C.I. Acid Red</b>	<b>253</b>	<b>254</b>	<b>255</b>
<b>CHEMICAL CLASS</b>	Monoazo	Azo	Disazo
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Bright yellowish red —	Bright bluish red —	Bordeaux —
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	1, 2  Good; may be salted at boil — Acetate and cellulose— <i>ss</i>	2, 3  — III/2 Acetate and cellulose— <i>u</i>	1, 2  Moderate — Acetate— <i>u</i> , acrylic and polyester— <i>hs</i> , viscose—dyed
<b>DYEING: OTHER FIBRES</b>	Silk: neutral or weakly acid	Nylon: acetic acid Silk: acetic or formic acid	Nylon: acetic acid
<b>PRINTING</b>		Direct on wool	
<b>FASTNESS PROPERTIES</b> Method	ISO	ISO	ISO
Alkali	4-5*	4	3
Carbonising	4-5	—	4
Chlorination — alteration	4	—	3
staining wool	—	—	5
Decatising	3-4†	4-5	3
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	6	—	3
normal	6	4	3-4
2 × normal	6-7	—	4
Milling, alkaline — alteration	4†	2-3	4
staining wool	5	3	5
Milling, acid — alteration	4 (bluer)	—	4
staining wool	4-5	—	3-4
Peroxide bleaching — alteration	5	—	—
staining wool	3-4	—	—
Perspiration	5	4-5	3-4
Potting — alteration	4	—	—
staining wool	2	—	—
Sea water — alteration	5	4-5	4-5
staining wool	5	3	5
Stoving	5	—	3
Washing — alteration	4-5	3	4-5
staining wool	5	4	5
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	3 — Little change —	Fairly good — — Duller	4 4 2 3-4
<b>NON-TEXTILE USAGE</b>	See Leather Dyes section	See Leather Dyes section	
<b>NOTES</b>	*Fastness on silk (ISO): Light 5, 5-6, 6; Washing 4-5 (3-4) †Yellower and duller		

256	257	258	C.I. Acid Red
— —	Monoazo  —	Monoazo (1 : 2 metal complex)  —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Bluish red —	Bright bluish red Yellower, brighter	Bluish red Yellower	HUE Daylight Artificial light (tungsten)
Similar in properties to C.I. Acid Red 213	3  Good; may be salted at boil — Acetate and cotton— <i>u</i>	1, 2  Good; may be salted at boil — Acetate and cotton— <i>ss</i>	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
	Nylon: formic acid	Acrilan: acetic followed by sulphuric acid Nylon and silk: neutral or weakly acid	DYEING: OTHER FIBRES
		Direct on nylon, silk and wool	PRINTING
	ISO  3-4* 4-5 3-4 — 5  5-6 6 6-7  — — 4 3  — — 4-5 — —  4 3 4 5 5	Wool      Acrilan      Nylon      Silk 4-5      —      —      — 4-5      —      —      — 3-4      —      —      — —      —      —      — 4-5      —      —      — 6-7      —      —      — 7      7      7      6-7 7-8      —      —      —  5      4-5      5      — 5      4-5      5      — 3      —      —      — 3      —      —      —  4-5      —      —      — 3-4      —      —      — 4-5      4-5      5      4 2-3      —      —      — 2      —      —      —  5      —      5      4 5      —      —      — 4      —      —      — 5      4      5      3-4 5      5      —      —	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
	4-5 4 — 3	3 5 Unaffected 3	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
	See Leather Dyes section	See Leather Dyes section Woaled sheepskin	NON-TEXTILE USAGE
	*Fastness on nylon (ISO): Light 5; Water 4; Perspiration 4; Sea water 4; Washing 4-5		NOTES

# C.I. Acid Red 259—262

C.I. Acid Red	259	260
CHEMICAL CLASS	Monoazo (1:2 metal complex)	Disazo
C.I. CONSTITUTION NUMBER	—	—
HUE Daylight Artificial light (tungsten)	Yellowish red Yellower, brighter	Bright bluish red Yellower and brighter
DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres	1, 2  Good; may be salted at boil — Acetate and cotton—ss	1, 2  Good; may be salted at boil — Acetate and cellulose—ss
DYEING: OTHER FIBRES	Acrilan: acetic followed by sulphuric acid Nylon and silk: neutral or weakly acid	Nylon and silk: neutral or weakly acid
PRINTING	Direct and discharge processes on nylon, silk and wool	Direct and discharge processes on nylon, silk and wool
FASTNESS PROPERTIES Method	ISO Wool      Acrilan      Nylon      Silk	ISO Wool      Nylon      Silk
Alkali	4 —	3-4 —
Carbonising	3 —	4-5 —
Chlorination — alteration	3-4 —	3-4 —
staining wool	— —	— —
Decatising	4-5 —	5 —
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal	5-6 —	5-6 —
normal	6 —	6 —
2 × normal	6-7 —	6-7 —
Milling, alkaline — alteration	4-5 —	4 —
staining wool	5 —	4-5 —
Milling, acid — alteration	3 —	4-5 —
staining wool	4 —	4 —
Peroxide bleaching — alteration	4-5 —	4-5 —
staining wool	3 —	3-4 —
Perspiration	4-5 —	4-5 —
Potting — alteration	3 —	4-5 —
staining wool	1 —	4 —
Sea water — alteration	4 —	4-5 —
staining wool	5 —	4-5 —
Stoving	2-3 —	4-5 —
Washing — alteration	4-5 —	4 —
staining wool	5 —	4-5 —
OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron	4-5 5 — 3	4-5 4 — 3
NON-TEXTILE USAGE	See Leather Dyes section Wooled sheepskin	See Leather Dyes section
NOTES		Reactions in substance H <sub>2</sub> SO <sub>4</sub> conc.—bordeaux; on dilution—red Aq. soln. + HCl—no change; + NaOH—no change



261	262	C.I. Acid Red
Azo —	Monoazo (1:2 metal complex) —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Bluish red —	Yellowish red —	HUE Daylight Artificial light (tungsten)
1, 2 Migration poor but dyeings level — Acetate and viscose— <i>u</i> , cotton— <i>ss</i>	1, 2 Migration poor but dyeings level — Acetate and viscose— <i>u</i> , cotton— <i>ss</i>	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon and silk: ammonium sulphate or acetate	Nylon and silk: ammonium sulphate or acetate	DYEING: OTHER FIBRES
		PRINTING
AATCC*      ISO —              5† —              4-5 —              5 —              — —              4-5  5              5-6 5-6          6-7 6              6-7  —              5 —              4-5 —              — —              —  —              — —              — —              5 —              — —              —  —              5 —              5 —              5 —              4-5 —              4-5	AATCC*      ISO —              5 —              4 —              4-5 —              — —              5  5              5-6 6              6-7 7              7  —              4-5 —              5 —              — —              —  —              — —              — —              5 —              — —              —  —              5 —              5 —              4-5 —              4-5 —              5	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
2 — —	5 — — —	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
See Leather Dyes section	See Leather Dyes section	NON-TEXTILE USAGE
Good coverage of materials containing different grades of wool *Light fastness by Fade-Ometer †Fastness on nylon (ISO): Decatising 5; Light 6-7, 7, 7-8; Perspiration 5; Rubbing 5; Sea water 5 (5); Washing 5 (3-4)	*Light fastness by Fade-Ometer	NOTES

**C.I. Acid Red 263—267**

<b>C.I. Acid Red</b>	<b>263</b>	<b>264</b>	<b>265</b>
<b>CHEMICAL CLASS</b>	Monoazo	Monoazo	—
<b>C.I. CONSTITUTION NUMBER</b>	—	18133	18129
<b>HUE</b> Daylight Artificial light (tungsten)	Yellowish red —	Bluish red —	
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	1, 2  Moderate — Acetate and viscose— <i>u</i> , cotton— <i>ss</i>	Suitable	Suitable
<b>DYEING: OTHER FIBRES</b>	Nylon: neutral or weakly acid Silk: neutral, with Glauber's salt		
<b>PRINTING</b>			
<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool	ISO  5* 4–5 5 — 5  5 6 6–7  5 5 — —  — — 5 — —  5 5 2–3 5 5		
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Discharges to white but darkens on exposure		
<b>NON-TEXTILE USAGE</b>	See Leather Dyes section		
<b>NOTES</b>	*Fastness on nylon (ISO): Decatising 5; Light 6–7, 7, 7–8; Perspiration 5; Rubbing 5; Sea water 5 (5); Washing 4–5 (5)		

266	266:1	267	C.I. Acid Red
Azo —	— —	Monoazo —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Bright bluish red (nylon) Yellower		Bluish red —	HUE Daylight Artificial light (tungsten)
	Similar in hue, application and properties to C.I. Acid Red 266, but slightly different chemically		DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Acetate: neutral, with salt Nylon: NaH <sub>2</sub> PO <sub>4</sub> (pale dyeings), ammonium acetate (medium dyeings) or acetic acid (heavy dyeings) Acrylic: 'Cuprous ion' method			DYEING: OTHER FIBRES
Direct on nylon, using urea			PRINTING
ISO Nylon* 5 — 5 5 5†  6 6 6  5 5 — —  — — 5† 2 1  — — — 4-5† 3-4			FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool  Decatising  Light, $\frac{1}{8}$ - $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Unsuitable for discharge Slightly affected — Unaffected			OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
		Anodised aluminium	NON-TEXTILE USAGE
*Fastness properties on nylon, after-treated with 4% formic+2% tannic acid (ISO); Perspiration 5 (5); Potting 4 (3); Washing 5 (5) †Testing methods of ICI			NOTES

**C.I. Acid Red 268—271**

<b>C.I. Acid Red</b>	<b>268</b>	<b>269</b>
<b>CHEMICAL CLASS</b>	Monoazo (1:2 metal complex)	Monoazo (1:2 metal complex)
<b>C.I. CONSTITUTION NUMBER</b>	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Red Duller	Red Yellower
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	1, 2	1, 2
<b>DYEING: OTHER FIBRES</b>	Nylon: ammonium sulphate+sodium phosphate Also applied to silk, jute and sisal	Nylon: Ammonium sulphate+sodium phosphate Applied to silk, jute and sisal
<b>PRINTING</b>	Direct on nylon, silk and wool	Direct on nylon, silk and wool
<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool	ISO  4-5 4-5 4 4-5 4-5  6-7 7 7-8  4-5 4-5 3-4 3-4  4 3-4 5 3-4 1  5 5 4-5 4-5 4-5 4-5	ISO  4-5 4-5 4-5 4-5 5  6 6 6-7  5 5 3-4 3  4-5 3 5 5 4 2  5 4-5 4-5 4-5 4-5
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	4 4 — 4-5	4 4 — 4-5
<b>NON-TEXTILE USAGE</b>	See Leather Dyes section	See Leather Dyes section
<b>NOTES</b>		



270	271	C.I. Acid Red
Monoazo (metal complex) —	Monoazo (metal complex) —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Bordeaux Slightly yellower and brighter	Bluish red Slightly bluer	HUE Daylight Artificial light (tungsten)
1, 2  Migration poor; initial strike level Acetate— <i>hs</i> , cotton— <i>ss</i>	1, 2  Migration poor; initial strike level Acetate and cotton— <i>hs</i>	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: slightly alkaline Silk: neutral or slightly acid	Nylon: slightly alkaline Silk: neutral or slightly acid	DYEING: OTHER FIBRES
		PRINTING
ISO  4 4 — 4-5  6 6-7 7  4 4 — —  4 3-4 4 1-2 2  5 4-5 4 4 4	ISO  5 4 — 5  5 5-6 6  4 4-5 — —  4-5 4-5 4 3 2  5 5 4-5 4 4-5	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool  Decatising  Light, $\frac{1}{3}$ - $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool  Perspiration Potting — alteration staining wool  Sea water — alteration staining wool  Stoving Washing — alteration staining wool
Good Duller — Duller	Good Duller — Duller	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
		NON-TEXTILE USAGE
Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—reddish violet; on dilution —bluish red	Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—orange; on dilution—red	NOTES

### C.I. Acid Red 272—275

<b>C.I. Acid Red</b>	<b>272</b>	<b>273</b>
<b>CHEMICAL CLASS</b>	Monoazo (metal complex)	Monoazo (1:2 metal complex)
<b>C.I. CONSTITUTION NUMBER</b>	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Red Practically unchanged	Bluish red Slightly yellower
<b>DYEING: WOOL</b> Method	1, 2	1, 2
Levelling S.D.C. migration test method/grade Staining other fibres	Migration poor; initial strike level — Acetate and cotton— <i>hs</i>	Moderate; unsuitable for salting at boil — Acetate and cellulose— <i>ss</i>
<b>DYEING: OTHER FIBRES</b>	Nylon: slightly alkaline Silk: neutral or slightly acid	Silk: neutral or slightly acid Applied to certain acrylic fibres
<b>PRINTING</b>		Direct on nylon, silk and wool (urea method)
<b>FASTNESS PROPERTIES</b> Method	ISO	AATCC
Alkali	4	—
Carbonising	4	4-5
Chlorination — alteration	—	—
staining wool	—	—
Decatising	4-5	4-5
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal	4-5	5-6
normal	5	6
2 × normal	5-6	7
Milling, alkaline — alteration	4-5	4
staining wool	4-5	3-4
Milling, acid — alteration	—	—
staining wool	—	—
Peroxide bleaching — alteration	4-5	—
staining wool	4	—
Perspiration	4	4-5
Potting — alteration	2	—
staining wool	2	—
Sea water — alteration	5	5
staining wool	4-5	4-5
Stoving	4	—
Washing — alteration	4-5	4
staining wool	4-5	3
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Good Duller — Duller	
<b>NON-TEXTILE USAGE</b>		
<b>NOTES</b>	<b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—orange; on dilution— yellowish red	<b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—orange; on dilution—reddish orange

274	275	C.I. Acid Red
Monoazo —	Monoazo (1 : 2 metal complex) —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Bright bluish red Slightly yellower	Yellowish red Slightly yellower	HUE Daylight Artificial light (tungsten)
1, 2  Moderate; unsuitable for salting at boil Acetate— <i>u</i> , cellulose— <i>ss</i>	1, 2  Good; may be salted at boil Acetate, acrylic, cellulose and polyester— <i>ss</i>	DYEING: WOOL Method  Levelling. S.D.C. migration test method/grade Staining other fibres
Silk: neutral or slightly acid	Nylon: Na <sub>3</sub> PO <sub>4</sub> , acetic acid + levelling agent	DYEING: OTHER FIBRES
Direct on nylon, silk and wool	Direct on nylon, silk and wool	PRINTING
ISO  4 4-5 3-4 4 4-5  4-5 5 5-6  4 4-5 4 4  4 3-4 4 3 2-3  4-5 4-5 4 3-4 4	ISO  4 (yellower) 4-5 4 (yellower, duller) 4-5 4 (yellower)  5-6 6 6-7  4-5 4-5 3-4 (yellower) 2-3  4 (yellower) 4 5 2-3 2  5 5 3-4 (yellower) 4-5 4-5	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ - $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
3 4 (bluer) — 3 (bluer and duller)	3-4 4 (duller) Little change 4 (bluer)	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
		NON-TEXTILE USAGE
Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—navy; on dilution—reddish violet	Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—yellow; on dilution—reddish orange	NOTES

**C.I. Acid Red 276—280**

<b>C.I. Acid Red</b>	<b>276</b>	<b>277</b>
<b>CHEMICAL CLASS</b>	Monoazo	Monoazo (1:2 metal complex)
<b>C.I. CONSTITUTION NUMBER</b>	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Bright red Slightly yellower	Bordeaux Slightly brighter and yellower
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	1, 2  Moderate: unsuitable for salting at boil — Acetate and cellulose—ss	1, 2  Good; may be salted at boil — Acetate, acrylic, cellulose and polyester—ss
<b>DYEING: OTHER FIBRES</b>	Silk: weakly acid or neutral	Nylon: Na <sub>3</sub> PO <sub>4</sub> , acetic acid + levelling agent
<b>PRINTING</b>	Direct on nylon, silk and wool	Direct on nylon, silk and wool
<b>FASTNESS PROPERTIES</b> Method	ISO	ISO
Alkali	4-5	4-5
Carbonising	4-5	4-5
Chlorination — alteration	4	4
staining wool	4-5	4-5
Decatising	4	4
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal	4	6-7
normal	4-5	7
2 × normal	5-6	7-8
Milling, alkaline — alteration	4	4-5
staining wool	4-5	5
Milling, acid — alteration	4-5	3
staining wool	4-5	3
Peroxide bleaching — alteration	4	4-5
staining wool	3-4	4-5
Perspiration	4-5	5
Potting — alteration	3	1-2
staining wool	2-3	1
Sea water — alteration	5	5
staining wool	5	5
Stoving	4 (yellow)	3-4
Washing — alteration	4	4-5
staining wool	4-5	4-5
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	3 4 (bluer) — 3-4 (bluer and duller)	4 4-5 Practically unchanged 4
<b>NON-TEXTILE USAGE</b>		See Leather Dyes section
<b>NOTES</b>	<b>Reactions in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—dull bordeaux; on dilution—bluish pink Aq. soln. + HCl—no change; + NaOH—yellow	<b>Reactions in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—bright reddish violet; on dilution—pink Aq. soln. + HCl—no change; + NaOH—trace weaker



278	279	280	C.I. Acid Red
Monoazo (1:2 metal complex) —	Monoazo (1:2 metal complex) —	Monoazo —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Red Yellower	Bright yellowish red Slightly yellower	Red Slightly yellower	HUE Daylight Artificial light (tungsten)
1, 2  Good; may be salted at boil — Acetate, acrylic, cellulose and polyester—ss	1, 2  Good; may be salted at boil — Acetate, acrylic, cotton and polyester—ss	3  Good; may be salted at boil — Acetate—u, cellulose—ss	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: Na <sub>3</sub> PO <sub>4</sub> , acetic acid +levelling agent	Nylon: Na <sub>3</sub> PO <sub>4</sub> , acetic acid +levelling agent		DYEING: OTHER FIBRES
Direct on nylon, silk and wool	Direct on nylon, silk and wool		PRINTING
ISO  4-5 4 (yellower) 4 (duller) 4-5 4-5  5-6 6 6-7  4 4-5 3 (yellower) 2-3  4-5 3-4 5 2 1  5 5 3-4 (yellower) 4 4	ISO  4 (yellower) 4 (yellower) 4 (yellow, duller) 4-5 4 (yellower)  5-6 6-7 7  4-5 4-5 3 (yellower) 3  4 4 5 2 2  5 5 3-4 (yellower) 4-5 5	ISO  4 (bluer, duller) 4 4 (duller) 4-5 4-5  6 6-7 6-7  1-2 2 4 3  2 3-4 3-4 2 2  3-4 3-4 4 (yellower) 1 3-4	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool  Decatising  Light, $\frac{1}{3}$ – $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool  Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
3-4 4 (duller) Practically unchanged 4-5	4 4-5 — 4 (duller)	3 4 (bluer and duller) — 4-5	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
	See Leather Dyes section		NON-TEXTILE USAGE
Reactions in substance H <sub>2</sub> SO <sub>4</sub> conc.—reddish yel- low; on dilution—reddish orange Aq. soln.+HCl—weaker; +NaOH—weaker	Reactions in substance H <sub>2</sub> SO <sub>4</sub> conc.—yellow; on dilution—reddish orange Aq. soln.+HCl—no change; +NaOH—no change	Reactions in substance H <sub>2</sub> SO <sub>4</sub> conc.—dull red; on dilution—pink Aq. soln.+HCl—duller; +NaOH—weaker	NOTES

**C.I. Acid Red 281—286**

<b>C.I. Acid Red</b>	<b>281</b>	<b>282</b>	<b>283</b>
<b>CHEMICAL CLASS</b>	Monoazo (1:2 metal complex)	Azo	Azo
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Bordeaux Slightly yellower	Red (chrome leather) —	Yellowish red (chrome leather) —
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	1, 2  Good; may be salted at boil — Acetate, acrylic, cellulose and polyester—ss		
<b>DYEING: OTHER FIBRES</b>	Nylon: Na <sub>3</sub> PO <sub>4</sub> , acetic acid + levelling agent		
<b>PRINTING</b>	Direct on nylon, silk and wool		
<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{8}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool	ISO  4-5 4-5 4 (duller) 4-5 4-5  6-7 7 7-8  4-5 5 3-4 (yellower) 3  4 3-4 5 2 2  5 5 4 (yellower) 4-5 4-5		
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	3 4 (yellower and duller) Practically unchanged 4-5		
<b>NON-TEXTILE USAGE</b>		See Leather Dyes section	See Leather Dyes section
<b>NOTES</b>	<b>Reactions in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—reddish vio- let; on dilution—pink Aq. soln. + HCl—no change; + NaOH—trace weaker		



**C.I. Acid Red 287—292**

<b>C.I. Acid Red</b>	<b>287</b>	<b>288</b>	<b>289</b>
<b>CHEMICAL CLASS</b>	Azo (metal complex)	Azo	Xanthene
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Bluish red —	Bluish red Little yellower	Bluish pink→bright bluish red Yellower
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres		3  Very good — Acetate, acrylic, cellulose and polyester— <i>u</i>	2  Fairly good — Acetate and cellulose— <i>ss</i> Acrylic and polyester— <i>u</i>
<b>DYEING: OTHER FIBRES</b>		Nylon: formic acid	Nylon: acetic acid
<b>PRINTING</b>		Direct on nylon and wool	Direct on nylon, silk and wool
<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool		ISO  4 4-5 — — 5  6 6 6-7  3-4 4 3-4 2  2 4 4 — —  4 2 3-4 3-4 4	ISO  3-4* 4 4-5 5 5  4 4 5  4 4-5 4 2-3  4 3 4-5 2 4-5  4-5 4 4 4-5 5
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron		Dischargeable to white Little duller — Little duller	Resistant to discharge Little bluer Little change Slightly yellower (duller)
<b>NON-TEXTILE USAGE</b>	See Leather Dyes section		
<b>NOTES</b>			*Fastness on nylon (ISO): Alkali 5; Light 3-4, 4-5, 5-6; Washing (2) 4-5, 5; on silk (ISO): Alkali 3-4; Light 4, 5, 5; Milling (acid) 4-5, 1; Per- oxide bleach 1, 1; Perspiration 4-5; Sea water 4, 1; Stoving 4-5; Washing 4-5, 4-5



290	291	292	C.I. Acid Red
— —	Azo (metal complex) —	Azo (metal complex) —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
	Bluish red Yellower	Yellowish red —	HUE Daylight Artificial light (tungsten)
This C.I. Generic Name is discontinued	1, 2  Good; may be salted at boil — Acetate and cellulose— <i>hs</i>	1, 2  Good; may be salted at boil — Acetate and cellulose— <i>hs</i>	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
	Nylon and silk: ammonium acetate (3%)	Nylon and silk: ammonium acetate (3%)	DYEING: OTHER FIBRES
	Direct on nylon, silk and wool	Direct on nylon, silk and wool	PRINTING
	AATCC  — 3-4 4 — —  — 5-6 —  — — — —  — — Alk. 4; Acid 4-5 5 —  4-5 5 — 5 5	AATCC  — 2 (after neutralising 4-5) 4-5 — —  — 6 —  — — — —  — — 4 3 3  5 5 — 4-5 5	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
			OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
			NON-TEXTILE USAGE
	Reactions in substance H <sub>2</sub> SO <sub>4</sub> conc.—bluish violet; on dilution—dull violet Aq. soln.+HCl dilute— blue violet; +NaOH dilute —no change	Reactions in substance H <sub>2</sub> SO <sub>4</sub> conc.—orange; on dilution—light orange Aq. soln.+HCl dilute— light yellow (almost des- troyed); +NaOH dilute— centre destroyed, red outside ring	NOTES

C.I. Acid Red	293-294	295	296
<b>CHEMICAL CLASS</b>	—	Monoazo (1:2 metal complex)	Monoazo (1:2 metal complex)
<b>C.I. CONSTITUTION NUMBER</b>	—	—	15675
<b>HUE</b> Daylight Artificial light (tungsten)		Bluish pink Yellower	Bluish pink Yellower
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	These C.I. Generic Names are discontinued	1, 2  Good; may be salted at boil — Acetate, acrylic, polyester and viscose—ss, cotton—s	1, 2  Good; may be salted at boil — Acrylic, cotton and viscose—u, acetate and polyester—ss
<b>DYEING: OTHER FIBRES</b>		Nylon: weakly alkaline (ammonia), neutral or weakly acid, preferably with a levelling agent Silk: neutral or acetic acid, preferably with a levelling agent*	Nylon: weakly alkaline (ammonia), neutral or weakly acid, preferably with a levelling agent Silk: neutral or acetic acid, preferably with a levelling agent*
<b>PRINTING</b>		Direct and Vigoureux processes on nylon and wool	Direct and Vigoureux processes on nylon and wool
<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool		ISO  4 4-5 4-5 5 4-5  6-7 6-7 6-7  4 4-5 4-5 4  4 3 5 2 1  5 5 3 4 4	ISO  3-4 4 4-5 5 4  6-7 6-7 6-7  4-5 4-5 4-5 3-4  4 3 5 2 1  5 5 3-4 4 4-5
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron		Dischargeable to white 4 — 3	Dischargeable to white 4 — 3-4
<b>NON-TEXTILE USAGE</b>			
<b>NOTES</b>		*Suitable for bast fibres	*Suitable for bast fibres

297	298	299	C.I. Acid Red
— —	Monoazo (1:2 metal complex) —	Disazo —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
	Red —	Bordeaux Yellower, brighter	HUE Daylight Artificial light (tungsten)
This C.I. Generic Name is discontinued. The dyes formerly listed under it now appear under C.I. Acid Red 151	1, 2 — — —	1 — — Acetate— <i>ss</i> , acrylic— <i>vss</i> , cellulose— <i>ss</i> , silk— <i>ss</i>	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
	Nylon: ammonium sulphate + sodium phosphate Silk: neutral (Glauber's salt) or weakly acid bath Applied to jute and sisal	Nylon: neutral or weakly acid Cotton— <i>s</i> , polyester— <i>u</i> Aftertreatment with tannin and tartar emetic improves wet fastness	DYEING: OTHER FIBRES
			PRINTING
	ISO 4-5 4 4 5 5  5-6 6 6-7  4 4-5 3-4 3  4-5 3-4 5 4-5 2  5 5 3-4 4-5 4-5	AATCC Wool      Nylon —      — —      — —      4-5* —      — —      — 4-5  3      —      5 4      5-6      5-6 5      —      6  —      —      — —      —      — —      —      — —      —      —  —      —      — 5      4 (acid)      5 —      —      — —      —      —  5      3      5 5      5      4-5 —      —      — 5      4-5 (II)      5 (Test 3) 5      3-4      4	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
	4-5 4-5 — 5	Good Slightly duller — Practically unchanged	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
	See Leather Dyes section	See Leather Dyes section	NON-TEXTILE USAGE
		Reactions in substance H <sub>2</sub> SO <sub>4</sub> conc.—olive green; on dilution—green-blue; further dilution—blue Aq. soln. + dilute HCl—dark brown ppt.; + dilute NaOH—yellow *Chlorinated water	NOTES

**C.I. Acid Red 300—303**

<b>C.I. Acid Red</b>	<b>300</b>	<b>301</b>
<b>CHEMICAL CLASS</b>	1:2 Metal complex	Azo
<b>C.I. CONSTITUTION NUMBER</b>	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Bluish red Yellower and brighter	Bordeaux Yellower
<b>DYEING: WOOL</b> Method	1	2
Levelling S.D.C. migration test method/grade Staining other fibres	Good — Acetate, cellulose and polyester— <i>ss</i> , acrylic— <i>u</i>	Good — Acetate and cellulose— <i>ss</i>
<b>DYEING: OTHER FIBRES</b>	Nylon: Na <sub>3</sub> PO <sub>4</sub> +a levelling agent; acetic or formic acid added for exhaustion Silk: neutral, with Glauber's salt	Nylon: acetic acid (ammonium sulphate may be added)
<b>PRINTING</b>	Vigoureux printing of wool	Direct on wool and silk
<b>FASTNESS PROPERTIES</b> Method	ISO	ISO
Alkali	4-5*	4 *
Carbonising	4-5	4-5
Chlorination — alteration staining wool	4-5 5	3 —
Decatising	—	4-5
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal	6 6-7 7	5 5-6 6
Milling, alkaline — alteration staining wool	4-5 4	2-3 2-3
Milling, acid — alteration staining wool	4-5 3-4	3 1
Peroxide bleaching — alteration staining wool	5 4	— 2
Perspiration	5	4-5
Potting — alteration staining wool	2 2	— —
Sea water — alteration staining wool	4-5 5	4-5 —
Stoving	4	5
Washing — alteration staining wool	4 3-4	4 3
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Not dischargeable 4-5 4-5 4-5	Good Duller Duller Duller, bluer
<b>NON-TEXTILE USAGE</b>		
<b>NOTES</b>	*Fastness on silk: Light 5-6, 6, 6-7; Perspiration 4; Hot pressing (dry) 4-5; Stoving 4-5; Washing 3-4 (4) Fastness on nylon (ISO): Light 7, 7, 7; Milling 5 (4); Perspiration 5; Sea water 5 (5); Washing 5 (4)	*Fastness on silk (ISO): Light 4-5, 5, 6; Water 3; Perspiration 3-4; Stoving 5; Acid (10% H <sub>2</sub> SO <sub>4</sub> ) 4-5; Washing 3 (3)



302	303	C.I. Acid Red
Azo —	Azo —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Dull bluish red Yellower	Bluish red Yellower	HUE Daylight Artificial light (tungsten)
1, 2 — — —	1, 2  — Acetate, acrylic, cellulose and polyester—u	DYEING: WOOL Method  Levelling. S.D.C. migration test method/grade Staining other fibres
Nylon: trisodium phosphate + ammonium sulphate Silk: non-ionic assistant for pale dyeings; ammonium sulphate or acetic acid for heavy dyeings	Nylon: pre-scoured at 70°C with Na <sub>3</sub> PO <sub>4</sub> Silk: acetic acid	DYEING: OTHER FIBRES
Direct on nylon, silk and wool	Direct on nylon, silk and wool	PRINTING
<div style="display: flex; justify-content: space-around;"> <div>Wool 3-4 4-5 4 — 4-5</div> <div>ISO Nylon 2-3* — — — 5</div> <div>Silk 3* — — — —</div> </div> <div style="display: flex; justify-content: space-around;"> <div>5 6 6-7</div> <div>4-5 5 6</div> <div>5 6 6-7</div> </div> <div style="display: flex; justify-content: space-around;"> <div>5 5 5 4</div> <div>5 3-4 — —</div> <div>— — — —</div> </div> <div style="display: flex; justify-content: space-around;"> <div>— — 5 4 2</div> <div>5 2-3* 1</div> <div>4-5 — —</div> </div> <div style="display: flex; justify-content: space-around;"> <div>4-5 5 — 5 5</div> <div>5 4-5 — 3</div> <div>4 3-4 — 2* 2-3</div> </div>	<div style="display: flex; justify-content: space-around;"> <div>Wool 3-4 4 3-4 — 5</div> <div>ISO Nylon 3 4-5 — — 4-5</div> <div>Silk 3-4 — — — —</div> </div> <div style="display: flex; justify-content: space-around;"> <div>4-5 5 6</div> <div>4 5 5</div> <div>4 5 5-6</div> </div> <div style="display: flex; justify-content: space-around;"> <div>5 5 4-5 5</div> <div>4-5 4-5 — —</div> <div>— — — —</div> </div> <div style="display: flex; justify-content: space-around;"> <div>— — 5 4-5 2-3</div> <div>4-5 1 3-4</div> <div>4-5 — —</div> </div> <div style="display: flex; justify-content: space-around;"> <div>5 5 — 5 5</div> <div>4-5 4-5 — 4-5 4-5</div> <div>4 3 — 3 3-4</div> </div>	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ – $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
4 4 Duller 5	Moderate 3 (bluer) Bluer 5	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
Wooled sheepskins	Wooled sheepskins	NON-TEXTILE USAGE
Reactions in substance H <sub>2</sub> SO <sub>4</sub> conc.—bluish red; on dilution—bluish red Aq. soln.+dilute HCl—bluish red; +dilute NaOH—violet *Weaker	Reactions in substance H <sub>2</sub> SO <sub>4</sub> conc.—red; on dilution—pink Aq. soln.+dilute HCl—bluish red; +dilute NaOH—reddish brown	NOTES

# C.I. Acid Red 304—309

C.I. Acid Red	304	305	306
<b>CHEMICAL CLASS</b>	Monoazo (1:2 metal complex)	—	Xanthene
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Bluish red Slightly yellower		Red —
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	1, 2  Migration poor; initial strike level — Acetate, acrylic, cellulose and polyester— <i>hs</i>	This C.I. Generic Name is discontinued. The dyes previously listed under it now appear under C.I. Acid Red 289	
<b>DYEING: OTHER FIBRES</b>	Nylon: neutral or weakly alkaline; ammonium acetate added for exhaustion Silk: Weakly acid		
<b>PRINTING</b>	Direct on nylon, silk and wool		
<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool	ISO  5 4-5 4 5 —  5-6 6 6-7  4-5 4 3-4 3-4  — — 4-5 — —  4-5 5 3-4 5 5		
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron			
<b>NON-TEXTILE USAGE</b>			Ball-pen inks (together with a basic dye)
<b>NOTES</b>			

307	308	309	C.I. Acid Red
Monoazo (1 : 2 metal complex) —	Monoazo (1 : 2 metal complex) —	Monoazo —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Bluish red Yellower	Bordeaux Yellower	Bright bluish red Yellower, brighter	HUE Daylight Artificial light (tungsten)
1  Good — Acetate, acrylic, polyester and viscose—ss, cotton—s	1, 2  — — Acetate and cellulose—u		DYEING: WOOL Method  Levelling. S.D.C. migration test method/grade Staining other fibres
Nylon: Na <sub>3</sub> PO <sub>4</sub> +levelling agent; exhaustion by acid addition for heavy dyeings Silk: neutral Glauber's salt; weak acid for heavy dyeings	Nylon: neutral Silk: broken soap bath+ammonium acetate	Nylon: neutral (main use) Good reservation of cellulosic fibres	DYEING: OTHER FIBRES
	Direct and Vigoureux printing on wool		PRINTING
Wool      ISO      Silk 4-5      —      — 4-5      —      — 4*      —      — 4-5      —      — —      —      —  6      6-7      5-6 6      7      6 6-7      7      6-7  4-5      4-5      — 4-5      3-4      — 4*      —      — 3-4      —      —  4-5      —      — 3-4      —      — 5      5      4 2-3      —      — 2-3      —      —  5      4-5      — 5      5      — 4*      4-5*      4-5* 4-5      4-5      4 5      3-4      4	*  4-5 5 5 5 5  6-7 7 7-8  5 5 5 5  5 5 5 4 2  5 5 5 5 4-5 (acid) 3-4 —  5 5 5 5 3-4 (No.2) —	ISO  — — — — —  — 1 2  — — — —  — — 4-5 (acid) 3-4 —  — — — 3-4 (No.2) —	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool  Decatising  Light, $\frac{1}{2}$ - $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool  Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool  Perspiration Potting — alteration staining wool  Sea water — alteration staining wool  Stoving Washing — alteration staining wool
Poor 4 4-5 4-5	4-5 3-4 4 4	Poor — — —	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
			NON-TEXTILE USAGE
*Yellower	*Methods of L. B. Holliday Ltd.		NOTES

**C.I. Acid Red 310—314**

<b>C.I. Acid Red</b>	<b>310</b>	<b>311</b>	<b>312</b>
<b>CHEMICAL CLASS</b>	Azo	Monoazo	Monoazo (1:2 metal complex)
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Dull red Brighter	Dull red —	Bordeaux Yellower
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres		1, 2  Good — —	1  — — Acetate, triacetate and acrylic—s, cellulose and polyester—ss
<b>DYEING: OTHER FIBRES</b>	Nylon (main use)	Nylon: acetic acid + ammonium acetate Silk: acetic acid + ammonium acetate	Nylon: neutral
<b>PRINTING</b>		Thermofix process on nylon	
<b>FASTNESS PROPERTIES</b> Method	ISO Nylon	ISO Wool      Nylon	ISO Wool      Nylon
Alkali	—	5	4-5
Carbonising	—	—	4
Chlorination — alteration	4-5*	—	4-5
staining wool	—	—	—
Decatising	5	5	4-5
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	4-5	5-6	6-7
normal	5	6-7	7
2 × normal	6	7	7-8
Milling, alkaline — alteration	—	5	4-5
staining wool	—	5	4-5
Milling, acid — alteration	—	—	4
staining wool	—	—	4-5
Peroxide bleaching — alteration	—	3-4*	4-5
staining wool	—	3-4	4-5
Perspiration	5	4-5	5
Potting — alteration	—	—	3
staining wool	—	—	1
Sea water — alteration	5	5	5
staining wool	4-5	4-5	5
Stoving	—	—	4*
Washing — alteration	4-5	4-5	4-5
staining wool	5	5	4-5
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	5 — — —	Dischargeable to white 4 (weaker) — 4-5	Poor 3-4 4 4
<b>NON-TEXTILE USAGE</b>	See Leather Dyes section		
<b>NOTES</b>	*Chlorinated water	*Yellower	*Yellower



313	314	C.I. Acid Red
Monoazo (1 : 2 metal complex) —	Monoazo (1 : 2 metal complex) —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Dull red Yellower	Dull bluish red —	HUE Daylight Artificial light (tungsten)
1  — Acetate, triacetate and acrylic—ss, cellulose and polyester—u		DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: neutral	Nylon (main use)	DYEING: OTHER FIBRES
	Direct on nylon	PRINTING
ISO Wool      Nylon 4-5        5 4           — 4           2 —          — 4-5        5  5           5-6 6           6 6-7        6-7  4-5        5 4-5        5 4           — 4-5        —  4           — 4           — 5           5 3-4        — 2           —  5           5 5           5 4*          5 4-5        5 4           5	ISO  — — — — 4-5  — — — 4-5  — — — — 4-5 4-5 —  4-5 5 4-5 4-5 5	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool  Decatising  Light, $\frac{1}{8}$ - $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool  Perspiration Potting — alteration staining wool  Sea water — alteration staining wool  Stoving Washing — alteration staining wool
Good 3 3 4		OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
		NON-TEXTILE USAGE
*Yellower		NOTES

**C.I. Acid Red 315—318**

<b>C.I. Acid Red</b>	<b>315</b>	<b>316</b>
<b>CHEMICAL CLASS</b>	Monoazo (1:2 metal complex)	Monoazo (1:2 metal complex)
<b>C.I. CONSTITUTION NUMBER</b>	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Bluish red —	Yellowish red —
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres		
<b>DYEING: OTHER FIBRES</b>	Nylon (main use)	Nylon: neutral (main use)
<b>PRINTING</b>	Direct on nylon	Direct on nylon
<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool	ISO Nylon — — — — 5 — 6-7 — — — — — — — — 5 — — 4-5 5 — 4-5 (Test 3) 4-5	ISO Nylon — — — — 4-5 — 7 — — — — — — — — 4-5 4 — 4 (bluer) 5 4-5 4 (bluer) 3-4 (Test 3)
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron		
<b>NON-TEXTILE USAGE</b>		
<b>NOTES</b>		

317	318	C.I. Acid Red
Azo (metallised)	Azo (metallised)	CHEMICAL CLASS
—	—	C.I. CONSTITUTION NUMBER
Yellowish red Yellower	Red Yellower	HUE Daylight Artificial light (tungsten)
1, 2	1, 2	DYEING: WOOL Method
Good — Acetate and cotton— <i>ss</i> , acrylic, polyester and viscose— <i>u</i>	Good — Acetate and cellulose— <i>ss</i> , acrylic and poly- ester— <i>u</i>	Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: neutral; ammonium acetate may be added for exhaustion Silk: neutral or weakly acid	Nylon: neutral; ammonium acetate may be added for exhaustion Silk: neutral or weakly acid	DYEING: OTHER FIBRES
Direct on nylon, silk and wool Vigoureux printing	Direct on nylon, silk and wool Vigoureux printing	PRINTING
ISO	ISO	FASTNESS PROPERTIES Method
4-5 — — — 4-5	4-5 — — — 4-5	Alkali Carbonising Chlorination — alteration staining wool Decatising
5 6 —	5 5-6 —	Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal
4-5 4-5 — —	4-5 4-5 — —	Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool
4-5 4 5 5 3	4-5 3-4 5 4-5 3	Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool
4-5 4 — 5 5	4-5 5 — 5 5	Sea water — alteration staining wool Stoving Washing — alteration staining wool
1-2 — Little change —	1 — — —	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
		NON-TEXTILE USAGE
		NOTES

**C.I. Acid Red 319—324**

C.I. Acid Red	319	320	321
CHEMICAL CLASS	Azo	Azo (1:2 metal complex)	Azo (1:2 metal complex)
C.I. CONSTITUTION NUMBER	—	—	—
HUE Daylight Artificial light (tungsten)	Bright yellowish red Yellower	Red No change	Bluish red —
DYEING: WOOL Method	1, 2	1	1
Levelling S.D.C. migration test method/grade Staining other fibres	— — Acetate— <i>u</i> , acrylic, cotton and polyester— <i>ss</i>	Moderate — Acetate— <i>s</i> , acrylic— <i>hs</i>	
DYEING: OTHER FIBRES	Nylon: alkaline or neutral (nylon 6.6 pH 7.5-8, nylon 6 pH 8-8.5) Silk: neutral or weakly acid Suitable for Acrilan	Nylon: neutral Silk	
PRINTING	Direct on wool		
FASTNESS PROPERTIES Method	AATCC		
Alkali	Wool 4 3*†	ISO Nylon 3-4 3*†	Silk 3-4 —
Carbonising	3†	—	—
Chlorination — alteration	—	—	—
staining wool	—	—	—
Decatising	4-5	4-5	—
Light, 1/3-1/2 normal	5	4	4-5
normal	6	5	5-6
2 × normal	6-7	6	6
Milling, alkaline — alteration	5	4-5	—
staining wool	5	3-4	—
Milling, acid — alteration	4-5	—	—
staining wool	4	—	—
Peroxide bleaching — alteration	—	—	—
staining wool	—	—	—
Perspiration	5	5	3-4
Potting — alteration	4	2-3†	—
staining wool	2	—	—
Sea water — alteration	4-5	5	4
staining wool	5	4-5	3-4
Stoving	—	—	—
Washing — alteration	4	4-5	2
staining wool	4-5	4	3
OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron	4-5 4 Duller 5	Very good Slight effect — Marked effect	
NON-TEXTILE USAGE			
NOTES	*Bluer †Weaker		



322	323	324	C.I. Acid Red
Azo —	Disazo 22238	Monoazo —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Red Yellower	Bright red Yellower	Red —	HUE Daylight Artificial light (tungsten)
	1, 2  Poor; unsuitable for salting — Acetate— <i>u</i> , cotton— <i>hs</i>		DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: acetic acid Levelling 1-2 Acetate, cotton— <i>s</i> , viscose — <i>ss</i>	Silk: acetic acid or ammonium acetate (levelling moderate)		DYEING: OTHER FIBRES
	Direct on nylon and wool		PRINTING
AATCC  5 — — — —  4-5 6 —  — — — —  — — 3 — —  4-5 3-4* — 4-5 4*	ISO  4-5 4 3-4 4 4-5  4 4 5 4-5  4 3 3-4 — —  4-5 4 4 4-5 (Test 3) 4		FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool  Decatising  Light, $\frac{1}{2}$ - $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Good — — —	5 5 — 5		OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
		See Leather Dyes section	NON-TEXTILE USAGE
*Nylon	Reactions in substance H <sub>2</sub> SO <sub>4</sub> conc.—violet; on dilution—red Aq. soln.+dilute HCl—brick red ppt.; + dilute NaOH—red ppt.		NOTES

### C.I. Acid Red 325—330

C.I. Acid Red	325	326	327
CHEMICAL CLASS	Monoazo	Monoazo	—
C.I. CONSTITUTION NUMBER	—	—	—
HUE Daylight Artificial light (tungsten)	Bordeaux —	Bluish bordeaux —	
DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres			This C.I. Generic Name is discontinued. The dyes previously listed under it now appear under C.I. Acid Red 299
DYEING: OTHER FIBRES			
PRINTING			
FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool			
OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron			
NON-TEXTILE USAGE	See Leather Dyes section	See Leather Dyes section	
NOTES			

328	329	330	C.I. Acid Red
Monoazo (metallised) —	Monoazo (metal complex) —	Monoazo (metal complex) —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Bordeaux Yellower and brighter	Bluish red —	Red —	HUE Daylight Artificial light (tungsten)
1, 2  Moderate — Acetate, cellulose and poly-ester—ss			DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: weakly acid or weakly alkaline Silk: acetic acid or neutral			DYEING: OTHER FIBRES
Direct on acetate, nylon, silk and wool			PRINTING
ISO  4* 4 4 4-5 4-5  6 6-7 7  4 4 4 4  4 4 4 4 3  4 4-5 3-4 4-5 (No.3) 5			FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool  Decatising  Light, $\frac{1}{2}$ - $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
2-3 Slightly duller Slightly duller Much duller			OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
	Anodised aluminium Light fastness 7-8; weathering fastness very good	Anodised aluminium Light fastness 7	NON-TEXTILE USAGE
*Fastness on silk (ISO): Light 6; Washing 3 (4-5) Reactions in substance H <sub>2</sub> SO <sub>4</sub> conc.—deep violet; on dilution—reddish violet and ppt Aq. soln.+dilute HCl—ppt; + dilute NaOH—unchanged.			NOTES

**C.I. Acid Red 331—334**

<b>C.I. Acid Red</b>	<b>331</b>	<b>332</b>
<b>CHEMICAL CLASS</b>	Monoazo (metal complex)	Monoazo (metal complex)
<b>C.I. CONSTITUTION NUMBER</b>	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Yellowish red —	Yellowish red —
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres		
<b>DYEING: OTHER FIBRES</b>		
<b>PRINTING</b>		
<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool		
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron		
<b>NON-TEXTILE USAGE</b>	Anodised aluminium (especially for outside architecture) Light fastness 8; weathering fastness very good	Anodised aluminium (giving copper coloration) Light fastness 7–8
<b>NOTES</b>		



333	334	C.I. Acid Red
Disazo —	Monoazo —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Yellowish red (on nylon) Yellower	Yellowish red (on nylon) Yellower	HUE Daylight Artificial light (tungsten)
— — Acetate and cotton—s, polyester and viscose—ss	— — Cotton—ss-s, polyester—u, silk—hs, viscose—s	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: ammonium acetate; acetic or formic acid added for exhaustion. Wet fastness slightly improved by back-tanning (with reduction in fastness to light, alkali spotting and hot pressing)	Nylon: ammonium acetate; acetic or formic acid added for exhaustion. Wet fastness slightly improved by back-tanning (with reduction in fastness to decatising, hot-pressing and vulcanising)	DYEING: OTHER FIBRES
		PRINTING
ISO Nylon 5 2 3 4-5 5  — 5-6 5-6  5 5 — —  5 5 5 4 3  5 5 5 5 5	ISO  5 4-5 5 5 5  — 4-5 5  5 5 — —  5 5 5 4 2  5 5 5 5 4-5	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Readily dischargeable to a good white	Suitable for coloured but not white discharges	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
		NON-TEXTILE USAGE
		NOTES

**C.I. Acid Red 335—340**

C.I. Acid Red	335	336	337																																																																																																																																																																
CHEMICAL CLASS	Monoazo	Monoazo	Monoazo																																																																																																																																																																
C.I. CONSTITUTION NUMBER	—	—	—																																																																																																																																																																
HUE Daylight Artificial light (tungsten)	Bluish red Yellower	Bluish Red —	Bright red —																																																																																																																																																																
DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres	2  Moderate — Acetate— <i>u</i> , cotton and polyester— <i>s</i> , acrylic and viscose— <i>ss</i>	—  — — Acrylic—5, cellulose—5																																																																																																																																																																	
DYEING: OTHER FIBRES	Nylon: ammonium sulphate (slightly weaker and bluer than on wool) Unsuitable for Acrilan and nylon 11 Silk: acetic acid		Nylon: neutral or slightly acid																																																																																																																																																																
PRINTING	Direct on nylon, silk and wool																																																																																																																																																																		
FASTNESS PROPERTIES Method	<table><thead><tr><th></th><th>Wool</th><th>ISO Nylon</th><th>Silk</th></tr></thead><tbody><tr><td>Alkali</td><td>3</td><td>4</td><td>3-4</td></tr><tr><td>Carbonising</td><td>4-5</td><td>4-5</td><td>—</td></tr><tr><td>Chlorination — alteration</td><td>3-4</td><td>—</td><td>—</td></tr><tr><td>                                  staining wool</td><td>—</td><td>—</td><td>—</td></tr><tr><td>Decatising</td><td>4-5</td><td>4-5</td><td>—</td></tr><tr><td>Light, <math>\frac{1}{2}</math>—<math>\frac{1}{2}</math> normal</td><td>4</td><td>4</td><td>4</td></tr><tr><td>                                  normal</td><td>5</td><td>4-5</td><td>5</td></tr><tr><td>                                  2 × normal</td><td>5-6</td><td>4-5</td><td>5</td></tr><tr><td>Milling, alkaline — alteration</td><td>4-5</td><td>4-5</td><td>—</td></tr><tr><td>                                  staining wool</td><td>5</td><td>—</td><td>—</td></tr><tr><td>Milling, acid — alteration</td><td>5</td><td>—</td><td>—</td></tr><tr><td>                                  staining wool</td><td>5</td><td>—</td><td>—</td></tr><tr><td>Peroxide bleaching — alteration</td><td>—</td><td>—</td><td>—</td></tr><tr><td>                                  staining wool</td><td>—</td><td>—</td><td>—</td></tr><tr><td>Perspiration</td><td>4-5</td><td>4-5</td><td>4-5</td></tr><tr><td>Potting — alteration</td><td>4-5</td><td>1</td><td>—</td></tr><tr><td>                                  staining wool</td><td>2</td><td>1</td><td>—</td></tr><tr><td>Sea water — alteration</td><td>4-5</td><td>4-5</td><td>4</td></tr><tr><td>                                  staining wool</td><td>5</td><td>3</td><td>3</td></tr><tr><td>Stoving</td><td>—</td><td>—</td><td>—</td></tr><tr><td>Washing — alteration</td><td>4-5</td><td>4</td><td>3</td></tr><tr><td>                                  staining wool</td><td>4-5</td><td>4</td><td>3</td></tr></tbody></table>		Wool	ISO Nylon	Silk	Alkali	3	4	3-4	Carbonising	4-5	4-5	—	Chlorination — alteration	3-4	—	—	staining wool	—	—	—	Decatising	4-5	4-5	—	Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	4	4	4	normal	5	4-5	5	2 × normal	5-6	4-5	5	Milling, alkaline — alteration	4-5	4-5	—	staining wool	5	—	—	Milling, acid — alteration	5	—	—	staining wool	5	—	—	Peroxide bleaching — alteration	—	—	—	staining wool	—	—	—	Perspiration	4-5	4-5	4-5	Potting — alteration	4-5	1	—	staining wool	2	1	—	Sea water — alteration	4-5	4-5	4	staining wool	5	3	3	Stoving	—	—	—	Washing — alteration	4-5	4	3	staining wool	4-5	4	3	<table><thead><tr><th></th><th>ISO</th><th>AATCC Nylon</th></tr></thead><tbody><tr><td>Alkali</td><td>5</td><td>—</td></tr><tr><td>Carbonising</td><td>4-5</td><td>—</td></tr><tr><td>Chlorination — alteration</td><td>4-5</td><td>—</td></tr><tr><td>                                  staining wool</td><td>—</td><td>—</td></tr><tr><td>Decatising</td><td>5</td><td>—</td></tr><tr><td>Light, <math>\frac{1}{2}</math>—<math>\frac{1}{2}</math> normal</td><td>4-5</td><td>4-5 (1%)</td></tr><tr><td>                                  normal</td><td>5-6</td><td>5 (4%)</td></tr><tr><td>                                  2 × normal</td><td>6</td><td>—</td></tr><tr><td>Milling, alkaline — alteration</td><td>3-4</td><td>—</td></tr><tr><td>                                  staining wool</td><td>2-3</td><td>—</td></tr><tr><td>Milling, acid — alteration</td><td>—</td><td>—</td></tr><tr><td>                                  staining wool</td><td>—</td><td>—</td></tr><tr><td>Peroxide bleaching — alteration</td><td>—</td><td>—</td></tr><tr><td>                                  staining wool</td><td>—</td><td>—</td></tr><tr><td>Perspiration</td><td>5</td><td>5</td></tr><tr><td>Potting — alteration</td><td>—</td><td>—</td></tr><tr><td>                                  staining wool</td><td>—</td><td>—</td></tr><tr><td>Sea water — alteration</td><td>5</td><td>5</td></tr><tr><td>                                  staining wool</td><td>4</td><td>4</td></tr><tr><td>Stoving</td><td>5</td><td>—</td></tr><tr><td>Washing — alteration</td><td>2-3</td><td>4 (Test IIA)</td></tr><tr><td>                                  staining wool</td><td>2-3</td><td>4-5</td></tr></tbody></table>		ISO	AATCC Nylon	Alkali	5	—	Carbonising	4-5	—	Chlorination — alteration	4-5	—	staining wool	—	—	Decatising	5	—	Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	4-5	4-5 (1%)	normal	5-6	5 (4%)	2 × normal	6	—	Milling, alkaline — alteration	3-4	—	staining wool	2-3	—	Milling, acid — alteration	—	—	staining wool	—	—	Peroxide bleaching — alteration	—	—	staining wool	—	—	Perspiration	5	5	Potting — alteration	—	—	staining wool	—	—	Sea water — alteration	5	5	staining wool	4	4	Stoving	5	—	Washing — alteration	2-3	4 (Test IIA)	staining wool	2-3	4-5
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Perspiration	5	5																																																																																																																																																																	
Potting — alteration	—	—																																																																																																																																																																	
staining wool	—	—																																																																																																																																																																	
Sea water — alteration	5	5																																																																																																																																																																	
staining wool	4	4																																																																																																																																																																	
Stoving	5	—																																																																																																																																																																	
Washing — alteration	2-3	4 (Test IIA)																																																																																																																																																																	
staining wool	2-3	4-5																																																																																																																																																																	
OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron	2-3 3 Duller 5	4 — — —	— Duller — Yellower																																																																																																																																																																
NON-TEXTILE USAGE																																																																																																																																																																			
NOTES			Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—dull violet; on dilution—weak yellowish brown solution																																																																																																																																																																

338	339	340	C.I. Acid Red
Monoazo (metal complex)	Azo (metal complex)	Monoazo	CHEMICAL CLASS
—	—	—	C.I. CONSTITUTION NUMBER
Bluish red Yellower	Red Yellower	Bluish red Yellower	HUE Daylight Artificial light (tungsten)
		2	DYEING: WOOL Method
		4 — Acetate, acrylic, cellulose and polyester—s	Levelling S.D.C. migration test method/grade Staining other fibres
	Nylon (main use)	Silk (unweighted): acetic or formic acid or neutral	DYEING: OTHER FIBRES
			PRINTING
ISO Nylon	ISO Nylon	ISO Wool Silk (unweighted)	FASTNESS PROPERTIES Method
—	—	4 (bluer)	Alkali
—	—	4-5 (neutralised)	Carbonising
4*	4-5*	4 (acid)	Chlorination — alteration staining wool
—	—	4	Decatising
—	—	4-5	
—	—	5-6	Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal
6	6-7	5-6	normal
—	—	6	2 × normal
—	—	4	Milling, alkaline — alteration staining wool
—	—	3	Milling, acid — alteration staining wool
—	—	3-4	
—	—	3	
—	—	4	Peroxide bleaching — alteration staining wool
—	—	3	Perspiration
4-5	4-5	4-5	Potting — alteration staining wool
—	—	2	
—	—	1-2	
3-4	4-5	4	Sea water — alteration staining wool
5	—	4-5	Stoving
—	—	4-5	Washing — alteration staining wool
4-5 (No.2)	5 (No.2)	3	
5	5	3	
—	—	3-4 (wool); 3 (silk)	OTHER PROPERTIES
5	5	4-5	Dischargeability
—	—	4-5	Effect of metals — copper chromium iron
4	5	4-5	
			NON-TEXTILE USAGE
*Chlorinated water	*Chlorinated water		NOTES

**C.I. Acid Red 341—346**

<b>C.I. Acid Red</b>	<b>341</b>	<b>342</b>	<b>343</b>
<b>CHEMICAL CLASS</b>	Azo (1:2 metal complex)	Azo (1:2 metal complex)	Monoazo
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Bordeaux Yellower	Dull bordeaux Yellower and brighter	Yellowish red Yellower
<b>DYEING: WOOL</b> Method	3	—	
Levelling	3-4	4	
S.D.C. migration test method/grade	—	—	
Staining other fibres	—	—	
<b>DYEING: OTHER FIBRES</b>	Nylon		Nylon: bath pH 4.5-6.5, levelling fair Cotton—s, polyester—u, triacetate—ss
<b>PRINTING</b>			
<b>FASTNESS PROPERTIES</b> Method	ISO		ISO
	Wool	Nylon 6	Wool
Alkali	—	5	—
Carbonising	3-4	—	4 (neutralised)*
Chlorination — alteration	—	4-5*	4 (acid)
staining wool	—	—	4-5
Decatising	4	4-5	4-5
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal	5-6	6-7	6-7
normal	6	7	7
2 × normal	7	7-8	7-8
Milling, alkaline — alteration	4	—	4
staining wool	—	—	3-4
Milling, acid — alteration	2-3	—	—
staining wool	—	—	—
Peroxide bleaching — alteration	—	—	—
staining wool	—	—	—
Perspiration	4	5	5
Potting — alteration	4	—	2
staining wool	3	—	2
Sea water — alteration	3	5	5
staining wool	—	—	5
Stoving	—	—	—
Washing — alteration	4	4-5	3-4 (Test 3)
staining wool	5	—	3-4
<b>OTHER PROPERTIES</b> Dischargeability	3-4		Good
Effect of metals — copper	—		—
chromium	—		—
iron	—		—
<b>NON-TEXTILE USAGE</b>			
<b>NOTES</b>	*Chlorinated water	*Fastness on nylon (ISO): Light 7, 7-8, 7-8; Milling (alkaline) 4-5 (4-5); Sea water 5 (5); Water 5 (5); Washing 4-5 (4-5)	*Chlorinated water †Solvents ‡Heat



344	345	346	C.I. Acid Red
Monoazo —	Monoazo (metallised) —	Azo (metal complex) —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Red —	Bluish red —	Reddish bordeaux —	HUE Daylight Artificial light (tungsten)
			DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
	Nylon: neutral or slightly acid	Suitable for nylon and silk	DYEING: OTHER FIBRES
			PRINTING
	AATCC Nylon — — — — 7 (0·25%) 7-8 (1%) — — — — — — — — 4 (IIA) 5	ISO Silk and Nylon — — — — — — — — — 6-7 — — — — — 5 — — — 5 (40°C) —	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ - $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
			OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
See Leather Dyes section		See Leather Dyes section	NON-TEXTILE USAGE
	Reactions in substance H <sub>2</sub> SO <sub>4</sub> conc.—orange brown; on dilution—weak dull yellow solution		NOTES

**C.I. Acid Red 347—350**

<b>C.I. Acid Red</b>	<b>347</b>	<b>348</b>
<b>CHEMICAL CLASS</b>	Monoazo	Monoazo
<b>C.I. CONSTITUTION NUMBER</b>	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Dull bluish pink —	Bluish red Yellower
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres		
<b>DYEING: OTHER FIBRES</b>	Nylon	Nylon Levelling 3—4. Coverage of barré fibre 3—4 Acetate, triacetate, polyester and viscose— <i>u</i> , acrylic and cotton— <i>s</i> , silk and wool — <i>hs</i>
<b>PRINTING</b>		
<b>FASTNESS PROPERTIES</b> Method	ISO Nylon	ISO Nylon
Alkali	—	—
Carbonising	—	—
Chlorination — alteration	4 (bluer)*	5*
staining wool	—	—
Decatising	—	—
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal	5	5
normal	6	5
2 × normal	—	—
Milling, alkaline — alteration	—	—
staining wool	—	—
Milling, acid — alteration	—	—
staining wool	—	—
Peroxide bleaching — alteration	—	—
staining wool	—	—
Perspiration	4-5	5
Potting — alteration	—	—
staining wool	—	—
Sea water — alteration	4-5	5
staining wool	—	5
Stoving	—	—
Washing — alteration	4-5 (Test 3)	4-5 (60°C)
staining wool	—	4-5
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron		
<b>NON-TEXTILE USAGE</b>		
<b>NOTES</b>	Fastness on nylon (ISO): White spirit 5; Perchloroethylene 4-5; Water 4-5  *Chlorinated water	Fastness on nylon (ISO): Burnt gas fumes 5; Hot pressing (after 4 hr) 5; Rubbing (wet and dry) 5; Solvents 5; Sublimation (210°) 4-5 Tannin-tartar emetic aftertreatment results in reduced fastness to washing but reduced staining of adjacent whites  *Chlorinated water



**C.I. Acid Red 351—356**

<b>C.I. Acid Red</b>	<b>351</b>	<b>352</b>	<b>353</b>
<b>CHEMICAL CLASS</b>	Disazo	—	Monoazo
<b>C.I. CONSTITUTION NUMBER</b>	—	—	16256
<b>HUE</b> Daylight Artificial light (tungsten)	Yellowish red —	Bluish red Yellower	Yellowish red —
<b>DYEING: WOOL</b> Method	1	1, 2	2, 3
Levelling S.D.C. migration test method/grade Staining other fibres	Poor — Acetate— <i>u</i> , cellulose— <i>ss</i>	Moderate — Acetate— <i>u</i> , cellulose— <i>ss</i>	— — Cellulose— <i>sss</i> , nylon— <i>hs</i> , silk— <i>s</i>
<b>DYEING: OTHER FIBRES</b>	Nylon 6 and 6.6: sodium acetate + acetic acid	Nylon 6 and 6.6: sodium acetate + acetic acid	
<b>PRINTING</b>			
<b>FASTNESS PROPERTIES</b> Method	ISO Nylon 6.6	ISO Nylon 6.6	ISO
Alkali	—	—	—
Carbonising	—	—	4
Chlorination — alteration staining wool	— —	— —	— —
Decatising	—	—	—
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal	—	—	—
normal	5–6	5–6	4
2 × normal	—	—	—
Milling, alkaline — alteration staining wool	— —	— —	3–4 4–5
Milling, acid — alteration staining wool	— —	— —	— —
Peroxide bleaching — alteration staining wool	— —	— —	— —
Perspiration	4–5	4–5	4
Potting — alteration staining wool	— —	— —	— —
Sea water — alteration staining wool	— —	— —	— —
Stoving	—	—	—
Washing — alteration staining wool	4 (Test 2) 4–5	4–5 (Test 2) 5	3–4 (40°C) 4–5
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Good — — —	Poor — — —	
<b>NON-TEXTILE USAGE</b>			Leather: on chrome tan- nage
<b>NOTES</b>			<b>Reactions in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—bluish red; on diln—red. Aq. soln + HCl—darker red; + NaOH—reddish orange



354	355	356	C.I. Acid Red
Monoazo —	Monoazo (metallised) —	Antraquinone —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Bluish red Yellower	Yellowish red —	Bluish red Slightly yellower	HUE Daylight Artificial light (tungsten)
1, 2  Poor — Cotton—ss	1, 2  Good — Cellulose—ss, silk and nylon—hs	1, 2  Poor — Cellulose—vss	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: neutral or weakly acid Silk: neutral or weakly acid		Nylon: ammonium acetate or neutral Silk: weakly acid or neutral	DYEING: OTHER FIBRES
Direct on silk, nylon and wool	Direct on nylon, silk and wool	Direct on nylon, silk and wool	PRINTING
JIS 4-5 — — — 3-4 4 4-5  — — 5 5  5 4-5 5 5 4-5  5 5 — 5 5	JIS 5 — — — 4 — 7  4 3 4-5 3  3 1-2 5 4-5 2-3  5 5 — 5 5	JIS 2 — — — — 4-5 5 5-6  3-4 3 4 5  4-5 3-4 4-5 4 3-4  5 5 5 4 5	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ - $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water -- alteration staining wool Stoving Washing — alteration staining wool
— — Little duller —	Good — — —	— — Little duller —	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
			NON-TEXTILE USAGE
			NOTES



C.I. Acid Violet	1	2	3
<b>CHEMICAL CLASS</b>	Monoazo	Monoazo	Monoazo
<b>C.I. CONSTITUTION NUMBER</b>	17025	17190	16580
<b>HUE</b> Daylight Artificial light (tungsten)	Dull reddish violet Redder	Bright reddish violet Much redder	Bluish violet Redder
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	3 — I/3 Cellulose and acetate— <i>u</i>	3 Moderate — Cellulose and acetate— <i>ss</i>	3 — I/2-3 Cellulose and acetate— <i>u</i>
<b>DYEING: OTHER FIBRES</b>	Nylon: acetic or formic acid	Silk: acetic acid	Nylon: formic acid
<b>PRINTING</b>	Direct on wool and nylon	—	Direct on wool and silk
<b>FASTNESS PROPERTIES</b> Method	AATCC	ISO	AATCC
Alkali	3*	4	1
Carbonising	4	4-5	3
Chlorination — alteration	—	2	3
staining wool	—	5	3
Decatising	4-5	4-5	4
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	2	4	—
normal	3	4-5	4
2 × normal	4	5	—
Milling, alkaline — alteration	1	1	1-2
staining wool	1	2	1-2
Milling, acid — alteration	—	3	—
staining wool	—	2	—
Peroxide bleaching — alteration	2	1	3
staining wool	2	5	3
Perspiration	3	3-4	1
Potting — alteration	—	1	4
staining wool	—	1	4
Sea water — alteration	2	1	3
staining wool	2	1	3
Stoving	1	1	3
Washing — alteration	1	1	2-3
staining wool	1	4	2-3
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Good Duller Little change Duller	Good Bluer and duller — Bluer and duller	Moderate Slightly duller, redder — Duller
<b>NON-TEXTILE USAGE</b>	See Leather Dyes section Paper		See Leather Dyes section Paper in the beater
<b>NOTES</b>	*Fastness on nylon—Light (normal) 2, Milling (alk.) 3, Perspiration 5, Washing 4-5		

# C.I. Acid Violet 4—7:1

C.I. Acid Violet	4	5	5:1
CHEMICAL CLASS	Disazo	Monoazo	Monoazo
C.I. CONSTITUTION NUMBER	—	18125	—
HUE Daylight Artificial light (tungsten)	Reddish violet Yellower	Reddish violet Slightly yellower	
DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres	2  Moderate — Cellulose—s, acetate—ss	3  — I/2 Cellulose and acetate—u	Chemically slightly different from C.I. Acid Violet 5 but very similar in properties and uses
DYEING: OTHER FIBRES	Nylon: formic acid Silk: acetic acid	—	
PRINTING	—	Direct on wool	
FASTNESS PROPERTIES Method	ISO	AATCC	ISO
Alkali	4	3-4	3-4
Carbonising	5	3	3-4
Chlorination — alteration	—	4	4
staining wool	—	4	4-5
Decatising	5	4	4-5
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	3	3	3-4
normal	3	3-4	4
2 × normal	4	4	4-5
Milling, alkaline — alteration	4	2-3	1
staining wool	—	2-3	4
Milling, acid — alteration	—	—	1
staining wool	—	—	1
Peroxide bleaching — alteration	—	—	1
staining wool	—	—	3
Perspiration	4-5	3-4	4
Potting — alteration	—	—	3
staining wool	—	—	1
Sea water — alteration	4	2	3-4
staining wool	—	2	3
Stoving	4	3-4	3-4
Washing — alteration	4-5	4-5	3-4
staining wool	—	4-5	4-5
OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron	Moderate No change No change No change	Moderate Slightly bluer, duller No change Weaker, slightly bluer	
NON-TEXTILE USAGE	See Leather Dyes section Paper	Inks Soap Staining satin shoes See Leather Dyes section	
NOTES			



6	7	7:1	C.I. Acid Violet
Monoazo 16600	Monoazo 18055	Monoazo	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Reddish violet Yellower	Reddish violet Slightly yellower		HUE Daylight Artificial light (tungsten)
3 Good; can be salted at the boil — Cellulose— <i>ss</i> , acetate— <i>u</i>	3 Can be salted at the boil 1/4-5 Cellulose and acetate— <i>u</i>	Slightly different from C.I. Acid Violet 7 but very similar in proper- ties and uses	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: acetic or formic acid Silk: sulphuric acid	Nylon: formic acid Silk: formic or sulphuric acid		DYEING: OTHER FIBRES
—	—		PRINTING
AATCC                      ISO	AATCC                      ISO		FASTNESS PROPERTIES Method
2                      3	3-4                      3-4		Alkali
3                      3	3                      3		Carbonising
—                      4	—                      2		Chlorination — alteration
—                      —	—                      4		staining wool
—                      4-5	4-5                      4		Decatising
—                      3	4                      3		Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal
4-5                      4	4                      4		normal
—                      4-5	5                      4-5		2 × normal
1                      1-2	2                      1		Milling, alkaline — alteration
—                      —	2                      5		staining wool
—                      1-2	—                      1		Milling, acid — alteration
—                      —	—                      1		staining wool
1                      4-5	1                      1		Peroxide bleaching — alteration
—                      —	1                      4		staining wool
1                      3	1                      2-3		Perspiration
—                      —	—                      2		Potting — alteration
—                      —	—                      1		staining wool
3-4                      —	2                      2		Sea water — alteration
—                      —	2                      2		staining wool
5                      5	4                      4		Stoving
1-2                      3	2                      2		Washing — alteration
1-2                      5	2                      4		staining wool
Moderate Bluer, duller Turns greenish black Bluer, duller	Moderate Slightly bluer, duller Little change Weaker		OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
See Leather Dyes section Wood stains	See Leather Dyes section Paper-surface colouring Soap Wood stains Biological stain Drugs and cosmetics See C.I. Food Red 11		NON-TEXTILE USAGE
Can be used as an afterchrome dye			NOTES

# C.I. Acid Violet 8—11

C.I. Acid Violet	8	9	9:1
<b>CHEMICAL CLASS</b>	Azo	Xanthene	
<b>C.I. CONSTITUTION NUMBER</b>		45190	
<b>HUE</b> Daylight Artificial light (tungsten)	Bright violet (acetate)* Redder	Bright reddish violet Redder, brighter	
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres		2, 3 — 1/3 Cellulose and acetate—ss	Slightly different chemically from C.I. Acid Violet 9 but very similar in properties and uses
<b>DYEING: OTHER FIBRES</b>	Acetate and nylon: neutral or weakly acid at 70–85°C (wool and silk dyed more heavily than acetate, cellulose—ss)	Nylon: formic acid Silk: acetic acid	
<b>PRINTING</b>	Direct on acetate and nylon	Direct on wool and silk	
<b>FASTNESS PROPERTIES</b> Method	ISO Acetate      Nylon	AATCC      ISO	
Alkali	5	3	3–4
Carbonising	3–4 <sup>(1)</sup>	4	3–4
Chlorination — alteration	—	1	2–3
staining wool	—	3–4	4–5
Decatising	4 <sup>(2)</sup>	4–5	4
Light, $\frac{1}{2}$ – $\frac{1}{2}$ normal	4	3	4
normal	4	4	4
2 × normal	5	5	5
Milling, alkaline — alteration	—	1–2	1
staining wool	—	2–3	4
Milling, acid — alteration	—	—	1
staining wool	—	—	1
Peroxide bleaching — alteration	—	1	1
staining wool	—	1	2–3
Perspiration	3	2	3
Potting — alteration	—	4–5	2
staining wool	—	4–5	1–2
Sea water — alteration	—	3–4	3–4
staining wool	—	2	2–3
Stoving	—	4	3–4
Washing — alteration	4	3	2–3
staining wool	—	3	3
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Not dischargeable	Poor Slightly duller Little change Yellower, duller	
<b>NON-TEXTILE USAGE</b>	Casein plastics. In spirit soln for shellac lacquers for metal foils. Pastel dyeings on woolled sheepskins and furs	Metal salts as pigments for paper coating and in artists' water colours. Paper. Straw. Anodised aluminium. Soap. Shoe creams. Wood stains. Biological stain. Drugs and cosmetics. See C.I. Solvent Violet 10 See Leather Dyes section	
<b>NOTES</b>	*Violet (nylon) (1) Gas fumes (2) Hot pressing <b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc. red		

10	11	C.I Acid Violet
Azo —	Monoazo 17060	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Bright bluish violet (acetate and nylon) Considerably redder	Dull reddish violet Slightly redder, brighter	HUE Daylight Artificial light (tungsten)
	3 — I/2 Acetate—ss, cellulose—u	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Acetate, delustred acetate and nylon: neutral or acid at 70–85°C	Nylon: formic acid Silk: acetic acid	DYEING: OTHER FIBRES
	Direct on wool and silk	PRINTING
ISO Acetate                  Nylon 5                                  — 2 <sup>(1)</sup> — —                                  — —                                  — 4 <sup>(2)</sup> —  4                                  1 4–5                                2 5                                  2–3  —                                  — —                                  — —                                  — —                                  —  —                                  — —                                  — 4                                  5 —                                  — —                                  —  —                                  — —                                  — 3                                  4 —                                  —	AATCC                      ISO  5                                  4 2                                  1 —                                  4 —                                  5 4–5                                4–5  5                                  4–5 5                                  5 6                                  6  4                                  1 4                                  1 —                                  1 —                                  1  1                                  2 1                                  1 3                                  4 —                                  1 —                                  1  3                                  4 3                                  2 5                                  4–5 3                                  3 3                                  1	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ – $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Not dischargeable — — —	Moderate Duller — Duller, somewhat weaker	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
Casein plastics Pastel dyeings on woolled sheepskins and furs	See Leather Dyes section	NON-TEXTILE USAGE
(1) Gas fumes (2) Hot pressing  Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—yellowish red		NOTES

### C.I. Acid Violet

1258



15	16	17	C.I. Acid Violet	
Triphenylmethane 43525	Triphenylmethane 42560	Triphenylmethane 42650	CHEMICAL CLASS C.I. CONSTITUTION NUMBER	
Bright reddish blue→bluish violet Slightly redder	Bluish violet —	Bright bluish violet Redder	HUE Daylight Artificial light (tungsten)	
3 — I/2 Cellulose and acetate—s	3  Moderate — —	2, 3  — I/2 Cellulose and acetate—ss	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres	
Silk: acetic acid	Silk: neutral or broken degumming liquor	Silk: acetic acid	DYEING: OTHER FIBRES	
Direct on wool and silk		Direct on wool, silk, nylon and viscose	PRINTING	
AATCC 5 5 — 5  1 1-2 2  1 1 — —  — — 3 — —  4-5 4-5 5 2 2	ISO 3 4 3 5 4  1 1 2  3 — — —  1 — 3 1 —  2-3 — 3 — —	AATCC 2-3 4 2-3 — 3-4  1 1 1  3 3 — — 2-3 1 4 — —  3-4 3-4 4-5 3 3	ISO 3-4 3 4 5 4  1 1 2  2 4 3 2  1 5 4-5 1 1  3-4 2 3-4 3-4 2	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, 1/2 normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Poor Slightly yellower Little change Slightly yellower	— No change No change No change	Poor Slightly duller, weaker No change Slightly duller, weaker	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron	
Metal salts used as pigments for wood stains, writing and stamping inks Paper—dyeing crêpe tissues See Leather Dyes section		Metal salts used as pigments Paper. Straw. Anodised aluminium. Soaps. Inks See Leather Dyes section See C.I. Food Violet 1	NON-TEXTILE USAGE	
			NOTES	

C.I. Acid Violet	18	19	20
CHEMICAL CLASS	Azo	Triphenylmethane	Monoazo
C.I. CONSTITUTION NUMBER	—	42685	16625
HUE Daylight Artificial light (tungsten)	Bright reddish violet (acetate)* Yellower	Bright reddish violet Redder and brighter	Reddish violet Slightly redder
DYEING: WOOL Method		3	3
Levelling S.D.C. migration test method/grade Staining other fibres		— 1/3 Cellulose—ss, acetate—u	Good — Cellulose and acetate—u
DYEING: OTHER FIBRES	Acetate and nylon: neutral or weakly acid at 60–85°C	Nylon: formic acid Silk: formic or sulphuric acid	Silk: broken degumming liquor
PRINTING			Direct on wool and silk
FASTNESS PROPERTIES Method	ISO	AATCC ISO	ISO
Alkali	5† 5 <sup>(1)</sup>	1 1–2	1 1
Carbonising	—	—	1
Chlorination — alteration staining wool	—	—	5
Decatising	5 <sup>(2)</sup>	4	3–4
Light, ½–½ normal	3	2	1
normal	4	3	1
2 × normal	4–5	4	2
Milling, alkaline — alteration staining wool	— —	1 1	1 4
Milling, acid — alteration staining wool	— —	— —	3 1
Peroxide bleaching — alteration staining wool	— —	1 1	1 5
Perspiration	3	1	1
Potting — alteration staining wool	— —	— —	1 1
Sea water — alteration staining wool	— —	3 3	1 4
Stoving	—	2	1
Washing — alteration staining wool	4 —	1 1	1 5
OTHER PROPERTIES			
Dischargeability	Not dischargeable	Good	Moderate
Effect of metals — copper	—	Duller	Slightly bluer
chromium	—	Little change	—
iron	—	Slightly duller	Duller and weaker
NON-TEXTILE USAGE	Pastel dyeings on woolled sheep- skins	Biological stain Paper—colouring crêpe tissues Photographic films Soap See Leather Dyes section	Paper—dip staining
NOTES	*Bluer and duller (nylon) (1) Gas fumes (2) Hot pressing Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—bluish red †Fastness on nylon: Light 1–2, 1–2, 1–2; Perspiration 5, Wash- ing 4		

21	22	23	C.I. Acid Violet
Triphenylmethane 42580	— —	Triphenylmethane 42680	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Bright reddish violet Slightly redder	Bright reddish violet —	Bright violet Slightly redder	HUE Daylight Artificial light (tungsten)
3 Good — Cellulose and acetate—ss	1, 2, 3 — 1/3 Cellulose and acetate—hs	3 Good — Cellulose—s, acetate—ss	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Silk: neutral or in broken degumming liquor	Silk: neutral or acid	Silk: broken degumming liquor	DYEING: OTHER FIBRES
Direct on wool and silk	Direct on wool and silk	Direct on wool and silk	PRINTING
ISO 3 4-5 — —  1 1-2 2  2-3 — 4 —  1 — 3-4 — —  3-4 — 3 3 3	ISO — 3-4 2 5 4  4 4 5  1 4 1 1  1 3 4-5 2 1  3 2 3 2 3	ISO 2 4-5 — — 5  1 1 2  3 — 3 —  1 — 3 — —  2 — 3 4 3-4	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Moderate Little effect Unchanged Little duller	Poor Much duller — Slightly duller	Poor Little change Little change Slightly duller	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
Pigment manufacture See Leather Dyes section	Metal salts as pigments for coating paper and staining of crêpe paper	See Leather Dyes section	NON-TEXTILE USAGE
			NOTES

# C.I. Acid Violet 24—29

C.I. Acid Violet	24	25	26
<b>CHEMICAL CLASS</b>	Triphenylmethane	Triphenylmethane	—
<b>C.I. CONSTITUTION NUMBER</b>	44055	42745	—
<b>HUE</b> Daylight Artificial light (tungsten)	Bright bluish violet Redder	Bluish violet Slightly redder	Bright reddish violet Duller and redder
<b>DYEING: WOOL</b> Method	2, 3	3	2, 3
Levelling S.D.C. migration test method/grade Staining other fibres	— I/2-3 Cellulose and acetate—s	Good — Cellulose and acetate—ss	— III/3 Cellulose and acetate—u
<b>DYEING: OTHER FIBRES</b>	Silk: acetic acid	Silk: broken degumming liquor	Silk: acetic, formic or sulphuric acid
<b>PRINTING</b>	Direct on wool and silk	Direct on wool and silk	Direct on wool and silk
<b>FASTNESS PROPERTIES</b> Method	ISO	ISO	AATCC ISO
Alkali	3	2	3-4 4
Carbonising	4	4	5 3-4
Chlorination — alteration	4-5	—	4 2
staining wool	5	—	4 4
Decatising	4	4	5 5
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	1	1	4 5
normal	1	1	4-5 5-6
2 × normal	2	2	5 6-7
Milling, alkaline — alteration	1	2-3	4 2
staining wool	5	—	4 2
Milling, acid — alteration	3	—	— 3
staining wool	2	—	— 1
Peroxide bleaching — alteration	1	1	— 1
staining wool	5	—	— 1
Perspiration	4-5	3	4-5 3
Potting — alteration	1	1-2	—
staining wool	1	—	—
Sea water — alteration	4-5	3-4	4 3
staining wool	2	—	4 2
Stoving	3	3	5 4
Washing — alteration	3	2	4-5 2
staining wool	2	3	4-5 2
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Poor Little change Little change Little change	Poor Slightly duller — Duller and weaker	Poor Little change Little change Little change
<b>NON-TEXTILE USAGE</b>	Paper See Leather Dyes section	Indian ink Writing inks Wood stains See Leather Dyes section	
<b>NOTES</b>			<b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—dull red



27	28	29	C.I. Acid Violet
Monoazo 13455	— —	Anthraquinone —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Dull violet Redder	Reddish violet Yellower	Bright violet Redder	HUE Daylight Artificial light (tungsten)
2, 3  Good — Acetate— <i>hs</i> , cellulose— <i>ss</i>	3  Good; can be salted at boil — Cellulose and acetate— <i>u</i>	3  Good — Cellulose and acetate— <i>u</i>	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Silk: sulphuric acid			DYEING: OTHER FIBRES
Direct on wool	Direct on wool and silk		PRINTING
ISO  4 4 — — 4  2 3 4  2 — — —  — — 2-3 — —  2-3 — 1-2 2-3 —	ISO  5 4 4 — 4-5  4-5 5 5-6  — — 2 —  5 — 3-4 — —  3 — 4 4-5 5	AATCC  2 3 — — —  — 5 —  2 — — —  1 — 4 1 —  2 — 4 4 —	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Good Slightly duller — Duller	Good Slightly duller — Duller	Moderate Slight change — No change	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
			NON-TEXTILE USAGE
		Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—reddish blue	NOTES

### C.I. Acid Violet 30—35

C.I. Acid Violet	30	31	32
CHEMICAL CLASS	Xanthene	Anthraquinone	—
C.I. CONSTITUTION NUMBER	45186		—
HUE Daylight Artificial light (tungsten)	Violet Redder	Bright bluish violet Redder	Violet Little change
DYEING: WOOL Method	2, 3	2, 3	3
Levelling S.D.C. migration test method/grade Staining other fibres	Moderate to good — Cellulose and acetate— <i>ss</i>	— III/2-3 Cellulose and acetate— <i>u</i>	Good; can be salted at boil — Cellulose and acetate— <i>vss</i>
DYEING: OTHER FIBRES	Silk: acetic acid or broken degumming liquor	Silk: acetic acid	Silk: acetic or sulphuric acid
PRINTING	Direct on wool and silk	Direct on wool and silk	
FASTNESS PROPERTIES Method	ISO	AATCC	ISO
Alkali	3-4	4-5	4
Carbonising	4	4-5	4-5
Chlorination — alteration	4	2-3	3-4
staining wool	—	2-3	5
Decatising	4	4-5	4
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal	2-3	4-5	5
normal	3-4	5	5-6
2 × normal	4	5	5-6
Milling, alkaline — alteration	3	3	1
staining wool	—	3	2
Milling, acid — alteration	2	—	4
staining wool	—	—	3
Peroxide bleaching — alteration	2	—	1
staining wool	—	—	2
Perspiration	2-3	4	4
Potting — alteration	2	—	1
staining wool	—	—	1
Sea water — alteration	2-3	4	4
staining wool	—	4	1
Stoving	4	4-5	4
Washing — alteration	3	3-4	2
staining wool	—	3-4	3
OTHER PROPERTIES			
Dischargeability	Poor	Poor	Moderate to good
Effect of metals — copper	Slightly redder	Duller	No change
chromium	Little change	Little change	—
iron	Slightly weaker	Duller	No change
NON-TEXTILE USAGE	Indian ink Writing inks Wood stains See Leather Dyes section		
NOTES			

33	34	35	C.I. Acid Violet
Anthraquinone —	Anthraquinone 61710 and 61800	— —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Bluish violet Much redder	Violet Redder	Bright bluish violet Redder	HUE Daylight Artificial light (tungsten)
2, 3 — I/2 Acetate—ss, cellulose—u	2, 3  Moderate — Cellulose and acetate—u	2, 3  Moderate — Cellulose and acetate—ss	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Silk: acetic or sulphuric acid	Nylon: acetic acid Silk: acetic, formic or sulphuric acid	Silk: neutral or acetic acid	DYEING: OTHER FIBRES
Direct on wool and silk	Direct on wool, silk and nylon	Direct on wool, silk and viscose	PRINTING
AATCC                  ISO	AATCC                  ISO	AATCC                  ISO	FASTNESS PROPERTIES Method
4                          3-4	1                          4	—                          3	Alkali
4                          4	4                          5	4                          5	Carbonising
—                          3-4	—                          —	—                          —	Chlorination — alteration
—                          5	—                          —	—                          —	staining wool
5                          4	5                          5	4                          4	Decatising
4                          5	4                          5-6	1                          1	Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal
4-5                      6	5                          6	1-2                      1	normal
5                          6-7	6                          7	2                          2	2 × normal
3                          1	2-3                      3-4	—                          —	Milling, alkaline — alteration
3                          1	—                          —	—                          —	staining wool
—                          3-4	—                          4	—                          2	Milling, acid — alteration
—                          1	—                          —	—                          —	staining wool
—                          1	4                          3	—                          5	Peroxide bleaching — alteration
—                          2	—                          —	—                          —	staining wool
3-4                      3-4	1                          3	4-5                      4	Perspiration
—                          1	—                          —	—                          —	Potting — alteration
—                          1	—                          —	—                          —	staining wool
3-4                      3	2                          3-4	4                          3	Sea water — alteration
3-4                      1	—                          —	—                          —	staining wool
4-5                      4	4                          4	—                          4	Stoving
4-5                      2	2                          3	4                          4	Washing — alteration
4-5                      4	2                          3-4	4                          5	staining wool
Poor Slightly duller No change Slightly duller	Moderate Slightly bluer and duller No change Slightly duller	Moderate No change No change Slightly duller	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
	Anodised aluminium See Leather Dyes section Soap	Paper	NON-TEXTILE USAGE
			NOTES

C.I. Acid Violet	36	37	38
CHEMICAL CLASS	Anthraquinone	—	Triphenylmethane
C.I. CONSTITUTION NUMBER	62010	—	42710
HUE Daylight Artificial light (tungsten)	Bluish violet Redder	Violet Little change	Violet→bluish violet Slightly redder
DYEING: WOOL Method	2, 3	2, 3	3
Levelling S.D.C. migration test method/grade Staining other fibres	— 1/2 Cellulose and acetate—ss	Good; can be salted at boil — Cellulose and acetate—ss	Good; can be salted at boil — Cellulose—ss, acetate—u
DYEING: OTHER FIBRES	Silk: acetic acid or broken degumming liquor	Silk: acetic or sulphuric acid	Silk: broken degumming liquor
PRINTING	Direct on wool and silk	Direct on wool and silk	Direct on wool and silk
FASTNESS PROPERTIES Method	AATCC	ISO	ISO
Alkali	4	2	4
Carbonising	4-5	4	4
Chlorination — alteration	—	3-4	—
staining wool	—	5	—
Decatising	5	4-5	4
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal	4-5	5	3
normal	5	6	4
2 × normal	5-6	7	4-5
Milling, alkaline — alteration	3	1-2	—
staining wool	3	1-2	—
Milling, acid — alteration	—	3-4	1-2
staining wool	—	1	—
Peroxide bleaching — alteration	—	1	5
staining wool	—	1	—
Perspiration	4	4	3-4
Potting — alteration	—	1	—
staining wool	—	1	—
Sea water — alteration	3-4	3	—
staining wool	3-4	1	—
Stoving	4-5	4	5
Washing — alteration	4-5	2	3
staining wool	4-5	2	5
OTHER PROPERTIES			
Dischargeability	Poor to moderate	Poor	Poor
Effect of metals — copper	Slightly duller	Little change	No change
chromium	Little change	Little change	No change
iron	Slightly duller	Little change	No change
NON-TEXTILE USAGE		Paper	
NOTES			



39	40	41	C.I. Acid Violet
Anthraquinone 68500	Monoazo (metallised)	Anthraquinone 62020	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Reddish violet Slightly redder	Dull bluish violet Redder	Reddish blue→bluish violet Redder	HUE Daylight Artificial light (tungsten)
3  Moderate to good — Acetate— <i>s</i> , cellulose— <i>u</i>	3  Good — Cellulose and acetate— <i>u</i>	3  Good — Acetate— <i>s</i> , cellulose— <i>vss</i>	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Silk: broken degumming liquor		Nylon: acetic acid or ammonium acetate. Suitable for differential dyeing (medium contrast)	DYEING: OTHER FIBRES
Direct on wool and silk		Direct on wool and nylon	PRINTING
ISO  3-4 4-5 — — 5  4 5 6  2-3 — 2-3 —  2 — 3-4 — —  3-4 — 4 3 3-4	AATCC  3-4 4-5 — — 5  6 6-7 7  4 — — —  — — 4-5 — —  4 — — 4 —	ISO  Wool 4 3-4 — — 4-5  5 5 6  2-3 2-3 3 1  2 2 3 — —  3-4 2-3 3-4 2-3 2-3  Nylon — 4-5 4-5 5 —  5-6 6 6  3-4 4 — —  — — 1-2 — —  5 2 3-4 4 4	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Moderate Slightly duller — Little change	Moderate to good Slightly duller Little affected Slightly duller	Poor Slightly duller — Duller	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
		Paper	NON-TEXTILE USAGE
	Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—reddish violet		NOTES

### C.I. Acid Violet 42—47

C.I. Acid Violet	42	43	44
CHEMICAL CLASS	Anthraquinone	Anthraquinone	Monoazo (metallised)
C.I. CONSTITUTION NUMBER	62026	60730	—
HUE Daylight Artificial light (tungsten)	Bright violet Redder	Bluish violet Slightly redder	Dull violet Redder
DYEING: WOOL Method	3	2, 3	1, 2, 3
Levelling S.D.C. migration test method/grade Staining other fibres	Good; can be salted at boil — Cellulose and acetate— <i>u</i>	— I/4 Acetate— <i>ss</i> , cellulose— <i>u</i>	Poor — Acetate and cellulose— <i>ss</i>
DYEING: OTHER FIBRES	Silk: broken degumming liquor	Nylon and silk: acetic acid	Silk: neutral or acetic acid
PRINTING	Direct on wool and silk	Direct on wool, silk and nylon	
FASTNESS PROPERTIES Method	ISO	AATCC	ISO
Alkali	3-4	3	3-4
Carbonising	4	4	3-4
Chlorination — alteration	—	—	4
staining wool	—	—	5
Decatising	4	5	4
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	5-6	3	5
normal	6	3	5
2 × normal	6-7	4	5-6
Milling, alkaline — alteration	2	1	1
staining wool	—	1	1
Milling, acid — alteration	3	—	3
staining wool	—	—	1
Peroxide bleaching — alteration	1-2	1	1
staining wool	—	1	5
Perspiration	2	2	3-4
Potting — alteration	—	—	1
staining wool	—	—	1
Sea water — alteration	3	2	2
staining wool	—	2	1
Stoving	3-4	4	3-4
Washing — alteration	3	1	1-2
staining wool	5	1	1-2
OTHER PROPERTIES Dischargeability	Moderate	Poor	Good
Effect of metals — copper	No change	Slightly duller	Slight change
chromium	—	—	No change
iron	No change	Duller	Considerable change
NON-TEXTILE USAGE	Paper	Anodised aluminium Drugs and cosmetics Paper Soap See Leather Dyes section	
NOTES			Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—blue

45	46	47	C.I. Acid Violet
— —	Azo (metallised)	Anthraquinone —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Violet Redder	Dull violet Distinctly redder	Bright reddish violet Redder	HUE Daylight Artificial light (tungsten)
2, 3  Moderate — Acetate— <i>ss</i> , cellulose— <i>u</i>	1, 2  Good — —	2  Moderate to good — Cellulose and acetate— <i>u</i> Reserve polyester—cotton 5/5	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: neutral or acid Silk: neutral or acetic acid	Nylon: ammonium acetate Silk: neutral or acetic acid	Nylon: acetic acid Silk: acetic acid or broken de- gumming liquor	DYEING: OTHER FIBRES
	Direct on wool, silk and nylon Vigoureux printing	Direct on wool, silk and nylon	PRINTING
ISO  4 5 — — 5  3 4 5  — — 3-4 —  — — 3 — —  4 — 4 2 3	ISO  5 4-5 4-5 4-5 5  6-7 7 7  4-5 4-5 3-4 2  4-5 3 5 2 1  5 5 4-5 5 4-5	ISO  4* 5 4-5 — 5  5 6 6-7  3 3-4 — —  3-4 2-3 4-5 — —  5 4-5 5 2-3 4	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Moderate Slightly duller Little change Slightly duller	Good — No change —	Poor Little change Little change Little change	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
			NON-TEXTILE USAGE
		*Fastness on nylon: Decatising 5; Light 3, 4-5, 5-6; Perspira- tion 5; Sea water 4-5, 4; Washing 4-5, 5	NOTES

### C.I. Acid Violet 48—53

C.I. Acid Violet	48	49	50
CHEMICAL CLASS	—	Triphenylmethane	Azine
C.I. CONSTITUTION NUMBER	—	42640	50325
HUE Daylight Artificial light (tungsten)	Bluish violet Much redder	Bright bluish violet Redder	Bluish violet Slightly redder
DYEING: WOOL Method	1, 2	2	2
Levelling S.D.C. migration test method/grade Staining other fibres	Moderate — Cellulose and acetate— <i>vss</i>	Moderate — Acetate— <i>s</i> , cellulose— <i>u</i>	Good — Cellulose and acetate— <i>ss</i>
DYEING: OTHER FIBRES	Nylon: ammonium sulphate or acetate Silk: acetic acid or broken degumming liquor	Nylon: formic acid Silk: neutral, acetic acid or broken degumming liquor	Silk: neutral or acetic acid
PRINTING	Direct on wool and silk Vigoureux printing	Direct on wool and silk	Direct on wool and silk
FASTNESS PROPERTIES Method	ISO	AATCC	ISO
Alkali	5*	4	4
Carbonising	5	3	4
Chlorination — alteration	4	—	—
staining wool	—	—	—
Decatising	5	—	4-5
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal	6	1	1
normal	6	1-2	1-2
2 × normal	7	2	2
Milling, alkaline — alteration	5	1	3-4
staining wool	5	—	—
Milling, acid — alteration	5	—	4
staining wool	5	—	—
Peroxide bleaching — alteration	3-4	1	1
staining wool	3	—	—
Perspiration	4-5	2	3-4
Potting — alteration	2-3	—	—
staining wool	—	—	—
Sea water — alteration	5	4	3-4
staining wool	—	—	—
Stoving	5	2	3-4
Washing — alteration	4-5	3-4	3
staining wool	5	3-4	3
OTHER PROPERTIES			
Dischargeability	Poor	Moderate	Poor
Effect of metals — copper	Little change	Little change	Bluer and duller
chromium	No change	Little change	Little change
iron	Little duller	Little change	Little change
NON-TEXTILE USAGE	See Leather Dyes section	Biological stain Drugs and cosmetics Inks Paper See C.I. Food Violet 2 See Leather Dyes section	
NOTES	*Fastness on nylon: Light 5-6, 6, 6-7; Perspiration 5; Washing 5, 5		



51	52	53	C.I. Acid Violet
Anthraquinone 62165	— —	— —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Bluish violet Redder	Bright reddish violet Yellower	Violet Redder	HUE Daylight Artificial light (tungsten)
1 Poor — Cellulose and acetate— <i>ss</i>	1, 2 Poor — Cellulose and acetate— <i>u</i>	2, 3 Good — Cellulose and acetate— <i>vss</i>	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: neutral or weak acid Silk: neutral or acetic acid	Silk: neutral or acetic acid	Silk: neutral or acetic acid	DYEING: OTHER FIBRES
Direct on wool and silk	Direct on wool and silk	Direct on wool and silk	PRINTING
ISO 4-5 4-5 4-5 — 3-4  4-5 5 6  5 — —  4-5 — 5 — —  — — 5 4-5 5	ISO 4-5 4-5 4-5 5 3-4  4-5 5 5-6  5 5 — —  3-4 4 5 — —  5 4 5 5 5	ISO 1-2 4-5 — — 4  3 3 4  2 3-4 — —  1 4 3-4 — —  3 4 4 2-3 3	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Poor No change No change Slightly duller	Poor Slightly duller and weaker Little change Duller	Moderate Little change Little change Slightly duller	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
	On chrome-tanned leather (ISO): Fastness to light 3, Penetration 2		NON-TEXTILE USAGE
	Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—dull bluish red		NOTES

# C.I. Acid Violet 54—58

C.I. Acid Violet	54	55	56	
CHEMICAL CLASS	—	—	Monoazo (metallised)	
C.I. CONSTITUTION NUMBER	—	—	16055	
HUE Daylight Artificial light (tungsten)	Reddish violet→Bluish red Much redder	Reddish violet Little change	Bluish violet Much redder	
DYEING: WOOL Method	1, 2	1, 2	3	
Levelling S.D.C. migration test method/grade Staining other fibres	Moderate — Cellulose— <i>ss</i> , acetate— <i>u</i>	Good — Cellulose and acetate— <i>u</i>	Good — Cellulose and acetate— <i>ss</i>	
DYEING: OTHER FIBRES	Silk: neutral or acetic acid	Silk: neutral or acetic acid	Nylon: formic acid Silk: acetic acid	
PRINTING	Direct on wool, silk, nylon and viscose	Direct on wool, silk and viscose	Direct on wool, silk and nylon	
FASTNESS PROPERTIES Method	AATCC	ISO	AATCC	ISO
Alkali	—	3-4	—	4-5
Carbonising	5	5	5	4
Chlorination — alteration	—	4-5	—	5
staining wool	—	—	—	—
Decatising	5	4-5	5	5
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	—	4	—	3
normal	4	4-5	4	4
2 × normal	—	4-5	—	4-5
Milling, alkaline — alteration	—	4-5	—	4-5
staining wool	—	4-5	—	5
Milling, acid — alteration	—	5	—	4-5
staining wool	—	—	—	—
Peroxide bleaching — alteration	—	5	—	5
staining wool	—	—	—	3
Perspiration	4-5	4-5	4-5	5
Potting — alteration	—	—	—	2-3
staining wool	—	—	—	—
Sea water — alteration	5	4-5	5	4
staining wool	—	—	—	4
Stoving	—	5	—	5
Washing — alteration	4-5	5	5	4-5
staining wool	4-5	5	5	3-4
3-4				4-5
OTHER PROPERTIES				
Dischargeability	Good	Moderate	Good	
Effect of metals — copper	No change	Slightly duller	Slightly bluer	
chromium	No change	Little change	Little change	
iron	Slightly duller	Slightly duller	Much weaker	
NON-TEXTILE USAGE			Anodised aluminium See Leather Dyes section	
NOTES				

<b>57</b>	<b>57:1</b>	<b>58</b>	<b>C.I. Acid Violet</b>
— —	— —	Monoazo (metallised)  16260	<b>CHEMICAL CLASS</b>  <b>C.I. CONSTITUTION NUMBER</b>
Dull violet Redder		Dull violet Redder and brighter	<b>HUE</b> Daylight Artificial light (tungsten)
1, 2  Good — Cellulose and acetate— <i>u</i>	Slightly different chemically from C.I. Acid Violet 57 but similar in properties and uses	3  Good; can be salted at boil — Cellulose and acetate— <i>u</i>	<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres
Silk: neutral or acetic acid		Nylon: formic acid Silk: acetic or formic acid	<b>DYEING: OTHER FIBRES</b>
Direct on nylon		Direct and discharge styles on wool	<b>PRINTING</b>
ISO  3-4 4 4 — 4  4-5 5 6  4-5 5 5 —  5 — —  5 — 2 5 5		AATCC      ISO  4                  4 4                  4-5 —                 4-5 —                 — 4                  4  5                  5-6 6                  6 7                  6-7  3-4                4 —                 — —                 3-4 —                 —  1                  1-2 —                 — 4                  4 —                 2-3 —                 —  3-4                4 —                 — 4                  4-5 3-4                4 —                 —	<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ - $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Moderate to good No change No change Duller		Good Slightly duller Little change Slightly weaker	<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron
		Anodised aluminium See Leather Dyes section	<b>NON-TEXTILE USAGE</b>
			<b>NOTES</b>

**C.I. Acid Violet 59—64**

<b>C.I. Acid Violet</b>	<b>59</b>	<b>60</b>	<b>61</b>
<b>CHEMICAL CLASS</b>	Azo (metallised)	Azo (metallised)	Azo (metallised)
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Reddish violet Redder	Dull bluish violet Much redder	— —
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	3  Good —	3  Good; can be salted at boil — Cellulose and acetate—ss	3  Good; can be salted at boil — Cellulose—ss, acetate—u
<b>DYEING: OTHER FIBRES</b>	Nylon: formic or sulphuric acid	Silk: acetic acid	
<b>PRINTING</b>	Direct on wool and nylon	Direct on wool and silk	
<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool	ISO  4 — — — 3-4  6 6-7 7  3 — — —  — — — 5 — — 5  3-4 3 —	ISO  3-4 3 2-3 — 3-4  4 5 5-6  3-4 — 2 —  1-2 — 4 3-4 —  4-5 — 4 4-5 —	ISO  3-4 3-4 4 — 4  6 6-7 7  4 — 4 —  4 — — 5 2-3 —  3-4 — 4 3-4 5
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Moderate to good Bluer and duller — Much duller	Good Duller No change Much weaker	— Duller Little change Duller
<b>NON-TEXTILE USAGE</b>		See Leather Dyes section	
<b>NOTES</b>			



62	63	64	C.I. Acid Violet
Monoazo (metallised) 14646	Anthraquinone 62160	Azo (metallised) —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Dull reddish violet Redder	Bluish violet —	— —	HUE Daylight Artificial light (tungsten)
1, also on a CrF <sub>3</sub> mordant Moderate — Cellulose and acetate—ss	2 Good — Cellulose and acetate—u	3 Good; can be salted at boil — Cellulose and acetate—u	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
	Silk: neutral or broken de- gumming liquor		DYEING: OTHER FIBRES
	Direct on wool and silk		PRINTING
ISO 4 2-3 2 4 4-5  5 5-6 6-7  3-4 — 4 2  3 3 4 — —  3-4 5 3 5 5	ISO 3-4 4 — — 4-5  5 5-6 6  3-4 — 4 —  3-4 — 4 — —  4 — 5 3 3-4	ISO 4 5 4 — 4  5 6 6-7  3-4 — 4 —  4 — 4 2-3 —  3 — 4 3-4 5	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ - $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Moderate to good 5 1 2	Moderate Slightly duller Little change Duller and weaker	— Slight change No change Slight change	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
			NON-TEXTILE USAGE
Solubility 2 g/l.			NOTES

**C.I. Acid Violet 65—70**

C.I. Acid Violet	65	66	67	
CHEMICAL CLASS	Azo (metallised)	—	Monoazo	
C.I. CONSTITUTION NUMBER	—	—	18005	
HUE Daylight Artificial light (tungsten)	Dull violet Redder	Dull violet Redder	Reddish violet Slightly yellower	
DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres	3  Good — Cotton and acetate — <i>ss</i> ; viscose— <i>u</i>	1, 2  Moderate — Cotton and acetate— <i>ss</i> Viscose— <i>u</i>	2  Moderate; can be salted at boil  Cellulose and acetate— <i>vss</i>	
DYEING: OTHER FIBRES		Silk: neutral or broken degumming liquor	Silk: degumming liquor	
PRINTING		Direct on wool, silk, nylon and viscose Vigoureux printing	Direct on wool and silk	
FASTNESS PROPERTIES Method	ISO	ISO Wool Nylon	ISO	
Alkali	4-5	5	5	3-4
Carbonising	4-5	5	5	4-5
Chlorination — alteration	—	5	5	—
staining wool	—	—	—	—
Decatising	4-5	5	5	4
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	5	6	6	3-4
normal	6	6-7	7	4
2 × normal	7	7	7-8	4
Milling, alkaline — alteration	4	4-5	5	3
staining wool	5	5	5	—
Milling, acid — alteration	—	—	5	—
staining wool	—	—	—	—
Peroxide bleaching — alteration	—	—	—	2
staining wool	—	—	—	—
Perspiration	5	5	5	2-3
Potting — alteration	—	—	—	1-2
staining wool	—	—	—	—
Sea water — alteration	4-5	5	5	3-4
staining wool	4	5	5	—
Stoving	4	5	5	4-5
Washing — alteration	4-5	4-5	5	3
staining wool	5	5	5	2-3
OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron	Good — — —	Good (on wool), moderate (on nylon) — Little change —	Moderate to good Slightly bluer Little change Slightly bluer	
NON-TEXTILE USAGE		See Leather Dyes section	See Leather Dyes section	
NOTES				

68	69	70	C.I. Acid Violet
— —	— —	— —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Violet Redder	Dull reddish violet Redder	Dull reddish violet Slightly yellower	HUE Daylight Artificial light (tungsten)
1, 2  Poor; initial strike level — Acetate—hs, cellulose—ss	3  Good Cellulose and acetate—u	1, 2  Poor; initial strike level — Acetate—s, cellulose—ss	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: neutral Silk: neutral or acetic acid	Silk: neutral or acetic acid	Nylon: neutral Silk: neutral or acetic acid	DYEING: OTHER FIBRES
Direct on wool, silk, nylon and viscose Vigoureux printing	Direct on wool and silk	Direct on wool, silk, nylon and viscose Vigoureux printing	PRINTING
ISO  5 4-5 5 5 4-5  6-7 7 7  4-5 5 4-5 4  4 4-5 5 3 5  5 5 5 4-5 .5	ISO  3-4 4-5 — — 4-5  5-6 6 6-7  5 — — —  — — 4-5 4-5 —  5 — 5 4-5 —	ISO  5 4-5 4-5 5 4  6-7 7 7  4-5 4-5 4-5 5  3-4 5 5 3-4 2  5 5 4-5 5 4-5	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ - $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Poor Unaffected Unaffected Unaffected	Poor Little change Little change Little change	Moderate No change No change No change	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
See Leather Dyes section		See Leather Dyes section	NON-TEXTILE USAGE
	Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—violet		NOTES

**C.I. Acid Violet 71—76**

<b>C.I. Acid Violet</b>	<b>71</b>	<b>72</b>	<b>73</b>
<b>CHEMICAL CLASS</b>	—	Triphenylmethane	—
<b>C.I. CONSTITUTION NUMBER</b>	—	42665	—
<b>HUE</b> Daylight Artificial light (tungsten)	Violet Yellower	Bright bluish violet Much redder	Dull violet Much redder and duller
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	1, 2  Poor; initial strike level — Acetate—s, cellulose—ss	2  Moderate — Cellulose and acetate—s	1, 2  Poor; initial strike level — Acetate—ss, cotton—vss, viscose—u
<b>DYEING: OTHER FIBRES</b>	Nylon: neutral Silk: neutral or acetic acid	Silk: neutral or acetic acid	Nylon: neutral or slightly alkaline. Silk: neutral or slightly acid
<b>PRINTING</b>	Direct on wool, silk, nylon and viscose Vigoureux printing	Direct on wool and silk	Direct on wool, silk, nylon and viscose Vigoureux printing
<b>FASTNESS PROPERTIES</b> Method	ISO	ISO	ISO
Alkali	5	4	4
Carbonising	4-5	4	4
Chlorination — alteration	4	—	3-4
staining wool	5	—	—
Decatising	5	3-4	5
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	6-7	1	6-7
normal	7	1	6-7
2 × normal	7-8	1-2	7
Milling, alkaline — alteration	4-5	3	5
staining wool	5	—	5
Milling, acid — alteration	4	4	—
staining wool	4-5	—	3
Peroxide bleaching — alteration	4	1	5
staining wool	5	—	—
Perspiration	5	3	—
Potting — alteration	4	—	—
staining wool	2-3	—	2-3
Sea water — alteration	5	3-4	4-5
staining wool	5	—	5
Stoving	5	2-3	4
Washing — alteration	5	3	4-5
staining wool	5	3	5
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Poor No change No change No change	Moderate Slightly duller Little change Slightly duller	Good Slightly duller Little affected Slightly duller
<b>NON-TEXTILE USAGE</b>	See Leather Dyes section	Paper Jute Coir Feathers Wood stains	
<b>NOTES</b>			



74	75	76	C.I. Acid Violet
— —	— —	Anthraquinone —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Bluish violet Slightly redder	Reddish violet Yellower	Violet Much redder	HUE Daylight Artificial light (tungsten)
	1, 2  Poor; initial strike level — Cellulose and acetate— <i>ss</i>	2, 3  Good — Cellulose and acetate— <i>u</i>	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: ammoniacal	Nylon: neutral or slightly alkaline Silk: neutral or slightly acid	Nylon: acetic or formic acid Silk: neutral or acetic acid	DYEING: OTHER FIBRES
	Direct on wool, silk, nylon and viscose Vigoureux printing	Direct on wool and silk	PRINTING
ISO  5* 5 4-5† — 4-5  6-7 7 7-8  4-5 5 4 4  4-5 — 5 — —  5 5 5 4-5 .4	ISO  4-5 5 3-4 — 5  6-7 7 7-8  5 5 3-4 3  4 4-5 5 2-3 1-2  4-5 5 4 4-5 5	AATCC  4 5 — — —  — 5-6 —  1 — — —  2 — 1 — —  3 — 5 1-2 —	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Good Unchanged — Unchanged	Good Unchanged Unchanged Slightly duller	Poor Little change — Much duller	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
		See Leather Dyes section	NON-TEXTILE USAGE
*On nylon 6 †Chlorinated water		Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—red  Literature USP 1,139,540	NOTES

**C.I. Acid Violet 77—82**

<b>C.I. Acid Violet</b>	<b>77</b>	<b>78</b>	<b>79</b>
<b>CHEMICAL CLASS</b>		Disazo	Monoazo (metallised)
<b>C.I. CONSTITUTION NUMBER</b>		12205	—
<b>HUE</b> Daylight Artificial light (tungsten)		Dull violet Redder	Dull violet Much redder
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres		1, 2  Poor; initial strike level — Cellulose and acetate— <i>u</i>	3  Good — Cellulose and acetate— <i>u</i>
<b>DYEING: OTHER FIBRES</b>		Nylon: neutral or slightly alkaline Silk: neutral or slightly acid	Nylon: acetic or formic acid Silk: sulphuric acid
<b>PRINTING</b>		Direct on wool, silk, nylon and viscose Vigoureux printing	Direct on wool and silk
<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool		ISO  4-5 4 4 — 4-5  6-7 6-7 7  4 4 3-4 4  4 3-4 5 2-3 2  5 5 5 4-5 5	AATCC  3 5 — — —  — 6 —  3 — — —  1 — 3 — —  4 — 5 3-4 —
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron		Good No change No change Duller	Good Unchanged Unchanged Much duller
<b>NON-TEXTILE USAGE</b>	Leather: vegetable, chrome and semi-chrome tannages. Bookbinding, shoe upper, suède and upholstery leathers. Brush staining. On chrome tannage (ISO): Fastness to light 3, Penetration 3		See Leather Dyes section
<b>NOTES</b>			<b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—red

80	81	82	C.I. Acid Violet
	Monoazo (metal complex) —	Monoazo (1:2 metal complex) —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
	Bright bluish violet Slightly redder	Reddish violet Slightly redder	HUE Daylight Artificial light (tungsten)
	1, 2  Good; initial strike level Cotton— <i>vss</i> , acetate— <i>s</i>	1, 2  Poor; initial strike level Cellulose— <i>vss</i> , acetate— <i>s</i>	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
	Nylon: neutral to slightly alkaline Silk: neutral or acetic acid	Nylon: neutral or slightly alkaline Silk: slightly acid	DYEING: OTHER FIBRES
		Direct on wool, silk and nylon	PRINTING
	ISO  3 4-5 3 — 4  6-7 7 7  4-5 — 3-4 — — — 5 — —  5 — 4 3-4 —	ISO  4-5 5 5 5 3-4  6-7 7 7-8  4-5 4 4 3 — — 5 3 2  5 5 4 4 4	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{8}$ - $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
	— Slightly affected Moderately affected Slightly affected		OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
See Leather Dyes section			NON-TEXTILE USAGE
	Literature FP 1,129,702; 1,161,640		NOTES

**C.I. Acid Violet 83—88**

<b>C.I. Acid Violet</b>	<b>83</b>	<b>84</b>	<b>85</b>
<b>CHEMICAL CLASS</b>	Monoazo (1:2 metal complex)	—	—
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Bluish violet Slightly redder	Dull bluish violet Redder	Reddish violet Redder
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	1, 2  Poor; initial strike level — Cotton— <i>vss</i> , acetate— <i>s</i>	1, 2  Good; initial strike level — —	1, 2  Good; initial strike level — Cellulose and acetate— <i>u</i>
<b>DYEING: OTHER FIBRES</b>	Nylon: neutral or slightly alkaline Silk: slightly acid	Nylon: slightly alkaline Silk: acetic acid	Nylon: slightly alkaline Silk: acetic acid
<b>PRINTING</b>	Direct on wool, silk and nylon		
<b>FASTNESS PROPERTIES</b> Method	ISO	ISO	ISO
Alkali	5	4	4
Carbonising	5	5	5
Chlorination — alteration staining wool	5 5	— —	— —
Decatising	4	5	5
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal	6-7 7 7-8	6 6-7 7	6-7 7 7-8
Milling, alkaline — alteration staining wool	4-5 4-5	5 5	5 5
Milling, acid — alteration staining wool	3-4 4	5 4-5	4 4-5
Peroxide bleaching — alteration staining wool	— —	— —	— —
Perspiration	5	5	5
Potting — alteration staining wool	3 2-3	3-4 2	2-3 2-3
Sea water — alteration staining wool	5 5	5 5	5 5
Stoving	4	4	3-4
Washing — alteration staining wool	4 4-5	5 5	4-5 5
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron		— Unaffected — Unaffected	— Unaffected — Unaffected
<b>NON-TEXTILE USAGE</b>			
<b>NOTES</b>			



86	87	88	C.I. Acid Violet
	Monoazo (1 : 2 metal complex) —	Monoazo (1 : 2 metal complex) —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
	Dull bluish violet —	Bluish violet Redder	HUE Daylight Artificial light (tungsten)
	1, 2  Good; can be salted at the boil — Cellulose and acetate—ss	1, 2  Good; can be salted at the boil — Cotton, acetate and polyester —ss	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
	Nylon Silk: neutral or slightly acid	Acrilan: acetic acid, exhaust with sulphuric acid Nylon and silk: neutral or weakly acid	DYEING: OTHER FIBRES
		Direct on wool, silk and nylon	PRINTING
	ISO  5 5 4-5 — 5  6 6-7 7  5 5 5 4  4-5 3 5 2 1  5 5 4 (redder) 4-5 5	ISO  4* 4 3-4 — 4-5  6-7 7 7-8  4-5 4 4 2-3  3-4 4-5 4-5 3-4 2  4-5 5 — 4-5 5	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ - $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
	5 — — —	2-3 4 Duller 3	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
See Leather Dyes section	Leather		NON-TEXTILE USAGE
		*Fastness on Acrilan: Light 7, Alk. milling 4-5, Perspiration 5, Washing 4-5; on nylon: Light 7, Alk. milling 4-5, Perspiration 4-5, Washing 4- 5; on silk: Light 6-7, Perspira- tion 3, Sea water 4-5, Wash- ing 4	NOTES

### C.I. Acid Violet 89—94

C.I. Acid Violet	89	90	91
<b>CHEMICAL CLASS</b>	Azo (1:2 metal complex)	Monoazo (1:2 metal complex)	Monoazo (1:2 metal complex)
<b>C.I. CONSTITUTION NUMBER</b>	—	18762	15681
<b>HUE</b> Daylight Artificial light (tungsten)	Reddish violet→violet	Reddish violet —	Violet —
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	2, 3  Good; can be salted at boil — Cellulose— <i>vss</i> , acetate— <i>u</i>	1, 2  Poor; initial strike level — Cellulose— <i>ss</i> , acetate— <i>vss</i>	1, 2  Poor; initial strike level — Cellulose— <i>ss</i> , acetate— <i>vss</i>
<b>DYEING: OTHER FIBRES</b>	Nylon: formic acid Silk: acetic acid	Nylon: neutral Silk: as wool	Nylon: neutral Silk: as wool
<b>PRINTING</b>	Wool and silk—direct and discharge	Direct on wool, silk and rayon Vigoureux printing	Direct on wool, silk and nylon Vigoureux printing
<b>FASTNESS PROPERTIES</b> Method	ISO	ISO	ISO
Alkali	2-3	5	4-5
Carbonising	3	4	4
Chlorination — alteration	3	4-5	4-5
staining wool	3	5	5
Decatising	4	4-5	5
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	2-3	5-6	6-7
normal	3	6	7
2 × normal	3	6-7	7
Milling, alkaline — alteration	2	4-5	4-5
staining wool	3	4	3
Milling, acid — alteration	3	4-5	5
staining wool	2-3	5	4-5
Peroxide bleaching — alteration	3-4	—	3
staining wool	4	—	3-4
Perspiration	3-4	4-5	5
Potting — alteration	2-3	—	—
staining wool	2	—	—
Sea water — alteration	4-5	—	—
staining wool	5	—	—
Stoving	2-3	4-5	3-4
Washing — alteration	3	2-3	3
staining wool	3	4-5	4
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Good Slightly weaker — Weaker	Not dischargeable 4-5 Little affected 5	Not dischargeable 4 — 3-4
<b>NON-TEXTILE USAGE</b>	Paper See Leather Dyes section	See Leather Dyes section	See Leather Dyes section
<b>NOTES</b>	<b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—blue; on dilution—violet		

92	93	94	C.I. Acid Violet
Monoazo (1:2 metal complex) 15708	Monoazo (metal complex) —	Disazo (1:2 metal complex) —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Bluish violet —	Dull violet Much redder	Violet No change	HUE Daylight Artificial light (tungsten)
1, 2  Poor; initial strike level — Cellulose—ss, acetate—vss	1, 2  Moderate — Cellulose—hs, acetate, acrylic and polyester—u	1, 2  — — —	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: neutral Silk: as wool	Modified acrylic Nylon and silk: neutral or slightly acid	Nylon: ammonium sulphate + sodium phosphate Jute: Sisal	DYEING: OTHER FIBRES
Direct on wool, silk and nylon Vigoureux printing	Direct on wool, silk and nylon	Direct on wool, silk and nylon	PRINTING
ISO  5 4-5 4-5 5 5  6 6-7 7  4 3-4 5 5  4-5 3 5 — —  — — 4-5 3 4	AATCC  5-4 4 — — 4  5-6 7-8 —  4 3 — —  4 4-5 4-5 — —  5 5 — 4 4	ISO  4-5 4-5 4-5 5 4-5  6 6-7 7  4-5 4-5 4-5 3-4  4-5 4 5 4 2  5 5 4-5 4-5 4-5	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ - $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Fairly good 3 — 3	Poor Slightly duller — Appreciably duller	4-5 3 — 4	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
See Leather Dyes section		See Leather Dyes section	NON-TEXTILE USAGE
	Reactions in substance H <sub>2</sub> SO <sub>4</sub> conc.—reddish blue; on dilution—reddish violet Aq. soln + dil. HCl—precipitated + dil NaOH—red		NOTES

**C.I. Acid Violet 95—100**

<b>C.I. Acid Violet</b>	<b>95</b>	<b>96</b>	<b>97</b>
<b>CHEMICAL CLASS</b>	Monoazo (1:2 metal complex)	Monoazo	Monoazo
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Violet Slightly redder	Violet Slightly redder	Bright reddish violet Yellower
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	1, 2  Good; can be salted at boil — Cellulose, acetate, acrylic and polyester—ss	1, 2  Good; can be salted at boil — Cellulose, acetate, acrylic and polyester—ss	1, 2  Good — Cellulose and acetate—u
<b>DYEING: OTHER FIBRES</b>	Nylon: acetic acid + Na <sub>3</sub> PO <sub>4</sub> + levelling agent	Nylon: acetic acid + Na <sub>3</sub> PO <sub>4</sub> + levelling agent	Silk: neutral or slightly acid
<b>PRINTING</b>	Direct on wool, silk and nylon	Direct on wool, silk and nylon	Direct on wool, silk and nylon
<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool	ISO  4 (bluer) 4-5 4 4 4-5 4 (redder)  6 6-7 7  4-5 5 4 (redder) 2-3  4 (bluer) 4 5 3 2-3  5 5 4 (redder) 4-5 5	ISO  4-5 4 4 4-5 4  5 6 6-7  5 5 3-4 (redder) 3-4  4-5 3-4 5 2-3 2  5 5 3-4 (redder) 4-5 4-5	ISO  4 (yellower) 5 4 (duller) 4-5 4 (yellower)  4 4-5 5  4 5 4 (yellower) 4-5  4 4 5 2-3 2-3  5 5 4-5 4 4-5
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	3-4 4-5 Unaffected 3-4 (yellower, duller)	4-5 4-5 (bluer) Yellower 4-5 (yellower, duller)	3 4 (bluer) Duller 4 (duller)
<b>NON-TEXTILE USAGE</b>			
<b>NOTES</b>	<b>Reactions in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—violet; on diln—pink	<b>Reactions in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—orange; on diln—violet	<b>Reactions in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—navy; on diln—reddish violet





### C.I. Acid Violet 101—106

C.I. Acid Violet	101	102	103	
CHEMICAL CLASS	Monoazo (1:2 metal complex)	Xanthene	Anthraquinone	
C.I. CONSTITUTION NUMBER	—	—	—	
HUE Daylight Artificial light (tungsten)	Reddish violet Yellower	Reddish violet Redder	Violet Brighter, redder	
DYEING: WOOL Method	1, 2	2	2	
Levelling S.D.C. migration test method/grade Staining other fibres	Good; migration poor — Cellulose, acetate, acrylic and polyester— <i>ss</i>	— — Cellulose and other fibres — <i>u</i>	Good — Cotton, acetate and polyester — <i>ss</i> , viscose and acrylic— <i>u</i>	
DYEING: OTHER FIBRES	Silk and nylon: slightly alkaline, exhaust with acetic acid	Nylon and silk: as wool	Nylon: acetic acid; tannin-tartar emetic aftertreatment to improve fastness Silk: neutral or acetic acid	
PRINTING	Direct on wool and silk			
FASTNESS PROPERTIES Method	ISO	ISO Wool      Silk      Nylon	ISO	
Alkali	5*	4	4	4 (bluer)*
Carbonising	4-5	4	—	5
Chlorination — alteration	3	5	—	—
staining wool	—	4-5	—	—
Decatising	4-5	4-5	*	4-5
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	6-7	3-4	3-4	3-4
normal	7	4-5	4-5	4
2 × normal	7-8	5	4-5	5
Milling, alkaline — alteration	5	3-4	—	4-5
staining wool	5	5	—	—
Milling, acid — alteration	4	4-5	4	5
staining wool	3-4	2	—	—
Peroxide bleaching — alteration	4	3-4	1	—
staining wool	3	2-3	—	—
Perspiration	5	4-5	4	5
Potting — alteration	2	3	—	3
staining wool	2	1-2	—	—
Sea water — alteration	5	4-5	4	5
staining wool	5	4	—	—
Stoving	4-5	4-5	3-4	5
Washing — alteration	4-5	3	3-4	4-5
staining wool	4-5	5	—	—
OTHER PROPERTIES				
Dischargeability	Moderate	—	—	
Effect of metals — copper	4	4	4	
chromium	Little effect	—	—	
iron	4	4	4	
NON-TEXTILE USAGE				
NOTES	*Fastness on nylon and silk: Light 5-6, 6, 6-7; Washing 4	*Hot pressing: silk 5 (dry), 4 (wet); nylon 5 (dry and wet) Solubility 80 g/l.	*Fastness on silk: Hot pressing 4 (dry), 4-5 (wet); Light 4, 4-5, 5; Perspiration 4, Stoving 5, Washing 4. Fastness on nylon: Light 6, 6-7, 7 Alk. milling 4; Perspiration 4-5, Sea water 4, Washing 4-5	

104	105	106	C.I. Acid Violet
Monoazo (1 : 2 metal complex) —	Monoazo (1 : 2 metal complex) —	Monoazo (metallised) —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Dull violet —	Dull violet —	Reddish violet —	HUE Daylight Artificial light (tungsten)
1, 2  — — Cellulose—s, acetate—ss		3  Moderate — —	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: neutral Silk: neutral or broken soap bath	Nylon	Silk: as wool	DYEING: OTHER FIBRES
Direct on wool Vigoureux printing	Nylon		PRINTING
ISO  — 3-4 4 4-5 4-5  6 6 6-7  4 5 4-5 3  4 4-5 5 3-4 2-3  5 5 5 4-5 5	ISO  — — — — —  — 7-8 —  — — — —  — — 4-5 — — 4-5 — — 4-5 —	ISO  5 2-3 — — 5  4 4-5 5  — — — —  — — — —  — — — —  — — — 3-4 4	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ - $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
5 5 4 3		— Unaffected Great change in hue	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
			NON-TEXTILE USAGE
Solubility 100 g/l			NOTES

**C.I. Acid Violet 107—112**

C.I. Acid Violet	107	108	109																																																																					
CHEMICAL CLASS	Monoazo (metal complex)	Monoazo (metal complex)	Anthraquinone																																																																					
C.I. CONSTITUTION NUMBER	—		—																																																																					
HUE Daylight Artificial light (tungsten)		Bluish violet	Bluish violet Redder																																																																					
DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres			1, 2  Good — Cellulose and acrylic—ss Acetate and polyester—s																																																																					
DYEING: OTHER FIBRES			Nylon: neutral Silk: neutral or acetic acid																																																																					
PRINTING			Direct on nylon																																																																					
FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, ⅓—½ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool			<table><tr><th>Wool</th><th>ISO Silk</th><th>Nylon</th></tr><tr><td>3-4</td><td>4-5</td><td>4-5</td></tr><tr><td>4</td><td>—</td><td>4</td></tr><tr><td>2</td><td>—</td><td>—</td></tr><tr><td>—</td><td>—</td><td>—</td></tr><tr><td>4</td><td>—</td><td>4</td></tr><tr><td>5</td><td>4-5</td><td>5</td></tr><tr><td>6</td><td>5</td><td>5-6</td></tr><tr><td>6</td><td>5</td><td>6</td></tr><tr><td>4</td><td>—</td><td>3-4</td></tr><tr><td>5</td><td>—</td><td>—</td></tr><tr><td>4-5</td><td>—</td><td>—</td></tr><tr><td>5</td><td>—</td><td>—</td></tr><tr><td>—</td><td>—</td><td>—</td></tr><tr><td>—</td><td>—</td><td>—</td></tr><tr><td>4-5</td><td>4-5</td><td>4</td></tr><tr><td>4</td><td>—</td><td>2</td></tr><tr><td>2</td><td>—</td><td>—</td></tr><tr><td>4</td><td>4-5</td><td>4-5</td></tr><tr><td>5</td><td>—</td><td>—</td></tr><tr><td>—</td><td>—</td><td>—</td></tr><tr><td>4</td><td>3-4</td><td>3-4</td></tr><tr><td>5</td><td>—</td><td>—</td></tr></table>	Wool	ISO Silk	Nylon	3-4	4-5	4-5	4	—	4	2	—	—	—	—	—	4	—	4	5	4-5	5	6	5	5-6	6	5	6	4	—	3-4	5	—	—	4-5	—	—	5	—	—	—	—	—	—	—	—	4-5	4-5	4	4	—	2	2	—	—	4	4-5	4-5	5	—	—	—	—	—	4	3-4	3-4	5	—	—
Wool	ISO Silk	Nylon																																																																						
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OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron			2 3 (redder) Stronger 4																																																																					
NON-TEXTILE USAGE	Anodised aluminium: Light 7-8, Weather—very good	Anodised aluminium Fastness: Light 7-8 Weather—very good																																																																						
NOTES			Solubility 60 g/l at 90°C Suitable for goods to be vulcanised																																																																					



110	111	112	C.I. Acid Violet																																																																																																																																							
Monoazo (1:2 metal complex) —	Azo (metal complex) —	Monoazo (1:2 metal complex) —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER																																																																																																																																							
Reddish violet Redder	Reddish violet Yellower	Dull bluish violet Redder	HUE Daylight Artificial light (tungsten)																																																																																																																																							
		1,2  — — —	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres																																																																																																																																							
Acrylic at 100–130°C Nylon at 100–120°C	Nylon: wet fastness can be improved by aftertreatment	Nylon and silk: as wool	DYEING: OTHER FIBRES																																																																																																																																							
Direct on wool, nylon, acrylic and triacetate		Vigoureux printing	PRINTING																																																																																																																																							
<div>ISO</div> <table><tr><th>Wool</th><th>Nylon</th><th>Acrylic</th><th>Triacetate</th></tr><tr><td>4-5</td><td>—</td><td>—</td><td>—</td></tr><tr><td>4-5</td><td>—</td><td>3-4</td><td>—</td></tr><tr><td>3-4</td><td>5*</td><td>ca 3*</td><td>4*</td></tr><tr><td>—</td><td>1†</td><td>1-2†</td><td>1†</td></tr><tr><td>5</td><td>—</td><td>—</td><td>—</td></tr><tr><td>5-6</td><td>6</td><td>5-6</td><td>6</td></tr><tr><td>6</td><td>7</td><td>ca 6</td><td>6-7</td></tr><tr><td>6-7</td><td>7-8</td><td>6-7</td><td>7</td></tr><tr><td>4-5</td><td>—</td><td>—</td><td>—</td></tr><tr><td>5</td><td>—</td><td>—</td><td>—</td></tr><tr><td>5</td><td>—</td><td>—</td><td>—</td></tr><tr><td>5</td><td>—</td><td>—</td><td>—</td></tr><tr><td>4-5</td><td>—</td><td>—</td><td>—</td></tr><tr><td>5</td><td>—</td><td>—</td><td>—</td></tr><tr><td>5</td><td>—</td><td>—</td><td>—</td></tr><tr><td>—</td><td>—</td><td>—</td><td>—</td></tr><tr><td>—</td><td>—</td><td>—</td><td>—</td></tr><tr><td>5</td><td>—</td><td>—</td><td>—</td></tr><tr><td>5</td><td>—</td><td>—</td><td>—</td></tr><tr><td>—</td><td>—</td><td>—</td><td>—</td></tr><tr><td>4-5</td><td>—</td><td>—</td><td>—</td></tr><tr><td>4-5</td><td>—</td><td>—</td><td>—</td></tr></table>	Wool	Nylon	Acrylic	Triacetate	4-5	—	—	—	4-5	—	3-4	—	3-4	5*	ca 3*	4*	—	1†	1-2†	1†	5	—	—	—	5-6	6	5-6	6	6	7	ca 6	6-7	6-7	7-8	6-7	7	4-5	—	—	—	5	—	—	—	5	—	—	—	5	—	—	—	4-5	—	—	—	5	—	—	—	5	—	—	—	—	—	—	—	—	—	—	—	5	—	—	—	5	—	—	—	—	—	—	—	4-5	—	—	—	4-5	—	—	—	<div>ISO</div> <table><tr><td>—</td></tr><tr><td>—</td></tr><tr><td>4*</td></tr><tr><td>—</td></tr><tr><td>—</td></tr><tr><td>—</td></tr><tr><td>—</td></tr><tr><td>7</td></tr><tr><td>—</td></tr><tr><td>—</td></tr><tr><td>—</td></tr><tr><td>—</td></tr><tr><td>—</td></tr><tr><td>—</td></tr><tr><td>—</td></tr><tr><td>3-4</td></tr><tr><td>4-5</td></tr><tr><td>4-5</td></tr><tr><td>—</td></tr><tr><td>—</td></tr><tr><td>—</td></tr><tr><td>4-5</td></tr><tr><td>5</td></tr></table>	—	—	4*	—	—	—	—	7	—	—	—	—	—	—	—	3-4	4-5	4-5	—	—	—	4-5	5	<div>ISO</div> <table><tr><td>5</td></tr><tr><td>4-5</td></tr><tr><td>—</td></tr><tr><td>—</td></tr><tr><td>5</td></tr><tr><td>6</td></tr><tr><td>6-7</td></tr><tr><td>7</td></tr><tr><td>—</td></tr><tr><td>5</td></tr><tr><td>5</td></tr><tr><td>5</td></tr><tr><td>4-5</td></tr><tr><td>—</td></tr><tr><td>—</td></tr><tr><td>5</td></tr><tr><td>5</td></tr><tr><td>—</td></tr><tr><td>4-5</td></tr><tr><td>5</td></tr></table>	5	4-5	—	—	5	6	6-7	7	—	5	5	5	4-5	—	—	5	5	—	4-5	5	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Wool	Nylon	Acrylic	Triacetate																																																																																																																																							
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Moderate (wool), good (nylon)	— 5 — 5	4 — — —	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron																																																																																																																																							
			NON-TEXTILE USAGE																																																																																																																																							
*Chlorinated water †Weak sodium chlorite	*Chlorinated water	Solubility 20g/l	NOTES																																																																																																																																							

# C.I. Acid Violet 113—116

C.I. Acid Violet	113	114
CHEMICAL CLASS	Azo (1:2 metal complex)	Azo (metal complex)
C.I. CONSTITUTION NUMBER	—	—
HUE Daylight Artificial light (tungsten)	Reddish violet Redder	Violet —
DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres		
DYEING: OTHER FIBRES	Nylon 6	Nylon Silk
PRINTING		
FASTNESS PROPERTIES Method	ISO	ISO*
Alkali	5	—
Carbonising	—	—
Chlorination — alteration	4-5*	—
staining wool	—	—
Decatising	4	—
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	6	—
normal	7	6
2 × normal	7-8	—
Milling, alkaline — alteration	—	—
staining wool	—	—
Milling, acid — alteration	—	—
staining wool	—	—
Peroxide bleaching — alteration	—	—
staining wool	—	—
Perspiration	5	4-5
Potting — alteration	—	—
staining wool	—	—
Sea water — alteration	4-5	—
staining wool	—	—
Stoving	—	—
Washing — alteration	4-5	5
staining wool	—	—
OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron		
NON-TEXTILE USAGE		See Leather Dyes section
NOTES	*Chlorinated water	*Silk and nylon

115	116	C.I. Acid Violet
Monoazo (metallised) —	Monoazo (metallised) —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Violet* Redder	Reddish violet —	HUE Daylight Artificial light (tungsten)
3  Good 4 Cotton and polyester— <i>u</i>	1, 2  Good — Cellulose— <i>ss</i> , nylon and silk— <i>hs</i>	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
	Nylon and silk: as wool	DYEING: OTHER FIBRES
Direct on wool, silk and nylon	Direct on nylon, silk and wool	PRINTING
ISO  — — — —  5-6 6 6-7  — — 4 4  — — — — —  — — 4-5 5	JIS  5 — — — —  7 — 7-8  4-5 3 4-5 3  2 2 4-5 (alk.) 3-4 2-3  5 5 — 5 5	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
	Good — — —	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
See Leather Dyes section		NON-TEXTILE USAGE
*Leather—Reddish violet		NOTES





C.I. Acid Blue	1	2
CHEMICAL CLASS	Triphenylmethane	Anthraquinone
C.I. CONSTITUTION NUMBER	42045	—
HUE Daylight Artificial light (tungsten)	Bright greenish blue Somewhat greener and brighter	Bright blue Little change
DYEING: WOOL Method	3	3
Levelling S.D.C. migration test method/grade Staining other fibres	— 1/5 Cellulose and acetate— <i>u</i> , nylon— <i>s</i> , wool— <i>d</i>	Good; can be salted at boil — Cellulose and acetate— <i>u</i>
DYEING: OTHER FIBRES	Silk: sulphuric or acetic acid; levelling good	
PRINTING	Wool and silk: direct	
FASTNESS PROPERTIES Method	AATCC	ISO
Alkali	3	4
Carbonising	3	4
Chlorination — alteration	—	3-4
staining wool	—	4
Decatising	4-5	4
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal	—	2
normal	1	2
2 × normal	—	3
Milling, alkaline — alteration	1-2	1-2
staining wool	1-2	2-3
Milling, acid — alteration	—	1
staining wool	—	1
Peroxide bleaching — alteration	2	1-2
staining wool	2	2
Perspiration	2	3
Potting — alteration	—	1
staining wool	—	1
Sea water — alteration	2-3	2-3
staining wool	2-3	1-2
Stoving	3	4
Washing — alteration	1-2	2
staining wool	1-2	3
OTHER PROPERTIES		
Dischargeability	Moderate	Poor
Effect of metals — copper	Greener and duller	—
chromium	Little affected	—
iron	Greener and duller	—
NON-TEXTILE USAGE	Heavy metal salts are used as pigments See Leather Dyes section Paper: chiefly for staining. Phenol-formaldehyde moulding powders, milled soaps, inks, methylated spirit wash and mass coloration of casein. Biological stain See C.I. Food Blue 3	
NOTES	Very good solubility in water	Good solubility in water

# C.I. Acid Blue 3—6

C.I. Acid Blue	3	4
CHEMICAL CLASS	Triphenylmethane	Monoazo
C.I. CONSTITUTION NUMBER	42051	16595
HUE Daylight Artificial light (tungsten)	Bright greenish blue —	Reddish blue Redder
DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres	3  Good — Cellulose and acetate— <i>u</i> , nylon— <i>hs</i>	3  — I/2 Cellulose and acetate— <i>u</i>
DYEING: OTHER FIBRES	Silk: acetic acid; levelling good Nylon Jute Feathers Straw	Silk: sulphuric acid; levelling good
PRINTING	Wool and silk: direct	
FASTNESS PROPERTIES Method	AATCC	ISO
Alkali	2	3-4
Carbonising	3	4
Chlorination — alteration	—	4
staining wool	—	—
Decatising	—	4-5
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	—	1
normal	1	1-2
2 × normal	—	2
Milling, alkaline — alteration	2	2
staining wool	—	—
Milling, acid — alteration	—	1
staining wool	—	—
Peroxide bleaching — alteration	2	3
staining wool	—	—
Perspiration	3	2-3
Potting — alteration	—	2
staining wool	—	—
Sea water — alteration	1	2
staining wool	—	—
Stoving	4-5	4
Washing — alteration	2	2-3
staining wool	—	—
OTHER PROPERTIES		
Dischargeability	Moderate	Moderate
Effect of metals — copper	Greener and duller	Little change
chromium	—	—
iron	Greener and duller	Little change
NON-TEXTILE USAGE	Heavy metal salts are used as pigments See Leather Dyes section Paper: in the beater, coating and surface colouring Anodised aluminium. Inks Aluminium salt is used as a colorant in cosmetics	
NOTES	Very good solubility in water Suitable for covering 'faded' wool	Good solubility in water

5	6	C.I. Acid Blue
Triphenylmethane 42052	Monoazo 17185	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Bright greenish blue Slightly greener	Navy Slightly redder	HUE Daylight Artificial light (tungsten)
2, 3  Good — Cellulose and acetate—ss	3  Moderate — Cellulose and acetate—u	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: acid Silk: neutral or acetic acid; good levelling	Silk: degumming liquor broken with acetic or sulphuric acid	DYEING: OTHER FIBRES
Wool, silk and viscose: direct	Wool: direct	PRINTING
AATCC                      ISO	ISO	FASTNESS PROPERTIES Method
3                              3-4	4	Alkali
3                              4-5	4-5	Carbonising
—                              4	—	Chlorination — alteration staining wool
3                              4-5	4-5	Decatising
—                              2	—	Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal
3                              2-3	3	normal
—                              3	—	2 × normal
1                              3	2	Milling, alkaline — alteration
—                              —	—	staining wool
—                              2	4	Milling, acid — alteration
—                              —	—	staining wool
—                              3	3	Peroxide bleaching — alteration
—                              —	—	staining wool
2                              3-4	3-4	Perspiration
—                              2-3	—	Potting — alteration
—                              —	—	staining wool
2                              3	3-4	Sea water — alteration
—                              —	—	staining wool
4                              4-5	3-4	Stoving
3                              3-4	2-3	Washing — alteration
—                              —	2-3	staining wool
Moderate Duller and greener — Duller and greener	Moderate Little change — Almost destroyed	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
Barium salt used as a bright greenish blue pigment for printing inks and rubber Calcium salt used in cosmetics Paper, inks, soaps and surface dyeing of casein plastics See Leather Dyes section		NON-TEXTILE USAGE
Good solubility in water	On silk the wet fastness properties are some- what lower than on wool and may be im- proved by a tannin-tartar emetic after treat- ment	NOTES

# C.I. Acid Blue 7—11

C.I. Acid Blue	7	8
CHEMICAL CLASS	Triphenylmethane	Anthraquinone
C.I. CONSTITUTION NUMBER	42080	58800
HUE Daylight Artificial light (tungsten)	Bright greenish blue Slightly greener	Dull greenish blue→navy
DYEING: WOOL Method	2, 3	3
Levelling S.D.C. migration test method/grade Staining other fibres	— I/3 Cellulose and acetate—u	Moderate — —
DYEING: OTHER FIBRES	Nylon: acetic or formic acid Silk: acetic, formic or sulphuric acid	
PRINTING	Wool and silk: direct	
FASTNESS PROPERTIES Method	AATCC	ISO
Alkali	3	3-4
Carbonising	4	3-4
Chlorination — alteration	—	3-4
staining wool	—	4
Decatising	4	4
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal	—	2
normal	1	2
2 × normal	—	3
Milling, alkaline — alteration	3-4	2
staining wool	3-4	3
Milling, acid — alteration	—	3-4
staining wool	—	2
Peroxide bleaching — alteration	2	2
staining wool	2	2-3
Perspiration	3	3
Potting — alteration	—	1
staining wool	—	1
Sea water — alteration	3	3
staining wool	3	2
Stoving	4	4-5
Washing — alteration	3	3
staining wool	3	3-4
OTHER PROPERTIES		
Dischargeability	Moderate	Moderate
Effect of metals — copper	Slightly duller	Greener and much weaker
chromium	Little affected	Greener
iron	Greener and duller	Almost destroyed
NON-TEXTILE USAGE	Barium salt used as a pigment for rubber Paper: surface colouring Cosmetics Soap Biological stain See Leather Dyes section	
NOTES		Can be used as a greenish navy afterchrome dye



9	10	11	C.I. Acid Blue	
Triphenylmethane 42090	Monoazo —	Triphenylmethane 42155	CHEMICAL CLASS C.I. CONSTITUTION NUMBER	
Bright greenish blue Much greener	Reddish blue Redder	Greenish blue Greener	HUE Daylight Artificial light (tungsten)	
3  Good — Cellulose and acetate— <i>vss</i>	3  Good —	3  Good — Cellulose and acetate— <i>u</i>	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres	
Silk: acid bath; good level- ling Nylon: pale dyeings with acetic or formic acid	Nylon: acetic or formic acid	Silk: degumming liquor broken with formic or sul- phuric acid	DYEING: OTHER FIBRES	
	Wool: direct	Wool and silk: direct	PRINTING	
AATCC 4 4 — 4-5  1 1 1  2-3 2-3 —  2 — 2 —  3-4 — 5 4 4	ISO 4 4 — 4  2 3 3  2 3 —  3 — 3 —  3 — 4 2-3 3	AATCC 1 3 — — —  2 2 —  1 — 2 —  2-3 3 1 —	ISO 2 4 1 — 4-5  2 2 3  2 — 3 —  1 3-4 —  3 — 4 2 3-4	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Moderate to good Slightly greener and duller Little effect Much greener and duller	Moderate to good Slightly duller — Greener and duller	Moderate to good Little duller — Somewhat duller and weaker	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron	
Barium salt is C.I. Pigment Blue 24. See Leather Dyes section Paper: beater dyeing, coat- ing and surface colouring Soap, woodstains Indicator. Biological stain See C.I. Food Blue 2	Biological stain Indicator See Leather Dyes section	Paper Wood stains Heavy metal salts as pig- ments	NON-TEXTILE USAGE	
		Fastness properties on silk are similar to those on wool	NOTES	

# C.I. Acid Blue 12—15

C.I. Acid Blue	12	13
CHEMICAL CLASS	—	Triphenylmethane
C.I. CONSTITUTION NUMBER	—	42571
HUE Daylight Artificial light (tungsten)	Bright blue Slightly greener	Reddish blue Slightly redder and duller
DYEING: WOOL Method	2, 3	3
Levelling S.D.C. migration test method/grade Staining other fibres	— II/3 Acetate— <i>u</i> , cellulose— <i>ss</i> , nylon— <i>hs</i>	— I/3–4 Cellulose and acetate— <i>ss</i> , nylon— <i>d</i>
DYEING: OTHER FIBRES	Silk: Glauber's salt or broken degumming liquor	Silk: neutral or acetic or sulphuric acid
PRINTING	Wool: direct	Wool and silk: direct
FASTNESS PROPERTIES Method	AATCC	ISO
Alkali	5	2
Carbonising	3	4
Chlorination — alteration	—	3–4
staining wool	—	4
Decatising	4	4–5
Light, $\frac{1}{2}$ – $\frac{1}{2}$ normal	1	1
normal	2	2
2 × normal	2	2
Milling, alkaline — alteration	3	1
staining wool	3	2
Milling, acid — alteration	—	4
staining wool	—	2
Peroxide bleaching — alteration	—	1
staining wool	—	5
Perspiration	5	3–4
Potting — alteration	—	2
staining wool	—	1
Sea water — alteration	4–5	4
staining wool	4–5	3
Stoving	4–5	4–5
Washing — alteration	3	3–4
staining wool	3	3–4
OTHER PROPERTIES		
Dischargeability	Moderate	Poor
Effect of metals — copper	Little change	Greener and duller
chromium	Little change	Little effect
iron	Greener	Slightly greener and weaker
NON-TEXTILE USAGE		See Leather Dyes section Paper: surface colouring
NOTES		Fastness properties on silk similar to those on wool except that fastness to milling, perspiration and washing is a little lower

14	15	C.I. Acid Blue																																																																																						
Anthraquinone —	Triphenylmethane 42645	CHEMICAL CLASS C.I. CONSTITUTION NUMBER																																																																																						
Bright blue (acetate); blue (nylon) Duller	Bright blue Slightly redder	HUE Daylight Artificial light (tungsten)																																																																																						
	2  I/2 — Cellulose and acetate—u, nylon—ss	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres																																																																																						
Acetate: neutral or weakly acid at 75–85°C with maximum substantivity at 80°C. Builds up fairly well at a slow rate of dye- ing. Can be used in package dyeing Nylon: good substantivity at 90–95°C	Silk: neutral or acetic acid; moderate to good levelling	DYEING: OTHER FIBRES																																																																																						
Suitable for direct printing	Wool, silk and viscose: direct	PRINTING																																																																																						
<div>ISO</div> <table><tr><th>Acetate</th><th>Nylon</th></tr><tr><td>4</td><td>—</td></tr><tr><td>—</td><td>—</td></tr><tr><td>—</td><td>—</td></tr><tr><td>—</td><td>—</td></tr><tr><td>4*</td><td>—</td></tr><tr><td>5</td><td>5–6</td></tr><tr><td>6</td><td>6</td></tr><tr><td>6</td><td>6</td></tr><tr><td>—</td><td>—</td></tr><tr><td>—</td><td>—</td></tr><tr><td>—</td><td>—</td></tr><tr><td>—</td><td>—</td></tr><tr><td>—</td><td>—</td></tr><tr><td>4</td><td>5</td></tr><tr><td>—</td><td>—</td></tr><tr><td>—</td><td>—</td></tr><tr><td>—</td><td>—</td></tr><tr><td>4–5</td><td>4–5</td></tr><tr><td>—</td><td>—</td></tr></table>	Acetate	Nylon	4	—	—	—	—	—	—	—	4*	—	5	5–6	6	6	6	6	—	—	—	—	—	—	—	—	—	—	4	5	—	—	—	—	—	—	4–5	4–5	—	—	<table><tr><th>AATCC</th><th>ISO</th></tr><tr><td>4</td><td>4</td></tr><tr><td>2</td><td>4</td></tr><tr><td>3</td><td>4</td></tr><tr><td>—</td><td>4–5</td></tr><tr><td>5</td><td>5</td></tr><tr><td>1</td><td>1</td></tr><tr><td>1</td><td>1</td></tr><tr><td>2</td><td>2</td></tr><tr><td>3</td><td>3</td></tr><tr><td>3</td><td>3–4</td></tr><tr><td>—</td><td>3–4</td></tr><tr><td>—</td><td>1–2</td></tr><tr><td>3</td><td>1–2</td></tr><tr><td>1</td><td>1–2</td></tr><tr><td>3–4</td><td>4–5</td></tr><tr><td>—</td><td>1</td></tr><tr><td>—</td><td>1</td></tr><tr><td>3–4</td><td>3–4</td></tr><tr><td>3–4</td><td>3</td></tr><tr><td>4</td><td>4</td></tr><tr><td>3–4</td><td>3–4</td></tr><tr><td>3–4</td><td>3</td></tr></table>	AATCC	ISO	4	4	2	4	3	4	—	4–5	5	5	1	1	1	1	2	2	3	3	3	3–4	—	3–4	—	1–2	3	1–2	1	1–2	3–4	4–5	—	1	—	1	3–4	3–4	3–4	3	4	4	3–4	3–4	3–4	3	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Acetate	Nylon																																																																																							
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Not dischargeable — — —	Good Slightly duller Little effect Duller	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron																																																																																						
Surface dyeing on casein plastics Pastel dyeings on woolled sheepskins	See Leather Dyes section Anodised aluminium Hydrated creams Heavy metal salts are used as pigments	NON-TEXTILE USAGE																																																																																						
*Hot pressing		NOTES																																																																																						

# C.I. Acid Blue 16—20

C.I. Acid Blue	16	17	18
<b>CHEMICAL CLASS</b>	—	Triphenylmethane	Azine
<b>C.I. CONSTITUTION NUMBER</b>	—	42625	50230
<b>HUE</b> Daylight Artificial light (tungsten)	Bright reddish blue Slightly duller	Reddish blue Somewhat redder	Reddish navy Redder and duller
<b>DYEING: WOOL</b> Method	3	2, 3	3
Levelling S.D.C. migration test method/grade Staining other fibres	Moderate — Cellulose and acetate—u, silk—s	Good — Cellulose and acetate—ss	— I/3 Cellulose and acetate—u
<b>DYEING: OTHER FIBRES</b>	Nylon: acetic or formic acid	Silk: Glauber's salt or degumming liquor broken with acetic acid	Nylon: formic acid Silk: acetic acid
<b>PRINTING</b>	Wool: direct	Wool and silk: direct	
<b>FASTNESS PROPERTIES</b> Method	AATCC	ISO	AATCC ISO
Alkali	1	4	3-4 —
Carbonising	3	4-5	3 4
Chlorination — alteration	—	—	— 4
staining wool	—	—	— 5
Decatising	—	5	4 5
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal	2	1	3 2
normal	2-3	1	3 3
2× normal	3	2	3 4
Milling, alkaline — alteration	1	3	2 1
staining wool	—	—	2 1
Milling, acid — alteration	—	3	— 3
staining wool	—	—	— 1
Peroxide bleaching — alteration	1	1	1 2
staining wool	—	—	1 5
Perspiration	1	3-4	1-2 4-5
Potting — alteration	—	—	— 2
staining wool	—	—	— 1
Sea water — alteration	4	4	4 3-4
staining wool	—	—	4 2
Stoving	2	2-3	3 4
Washing — alteration	1	3	2-3 3
staining wool	—	4	2-3 5
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Moderate to good No change — Much greener and duller	Poor Little greener — Somewhat weaker	Moderate Stronger and redder Little effect Slightly weaker and greener
<b>NON-TEXTILE USAGE</b>	See Leather Dyes section	Salts as pigments Paper	See Leather Dyes section
<b>NOTES</b>	<b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—reddish purple	On silk fastness properties are similar to those on wool except that fastness to perspiration is a little lower Fastness to washing and water is improved by treatment with tannin and tartar emetic	



<b>18:1</b>	<b>19</b>	<b>20</b>	<b>C.I. Acid Blue</b>
Azine —	Xanthene  45205	Azine  50405	<b>CHEMICAL CLASS</b>  <b>C.I. CONSTITUTION NUMBER</b>
	Reddish blue Little redder		<b>HUE</b> Daylight Artificial light (tungsten)
Slightly different chemically from C.I. Acid Blue 18 but similar in properties and usage	3  Moderate — Cellulose and acetate—ss		<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres
	Silk: degumming liquor broken with formic or sulphuric acid	Silk: sulphuric acid	<b>DYEING: OTHER FIBRES</b>
	Wool and silk: direct		<b>PRINTING</b>
	ISO 3-4 4 — 4  3 3-4 4  3 — — —  1-2 — 3 1-2 —  2-3 — 3-4 3-4 4	ISO Silk 2 — — — —  — 4 —  2 — — —  3 — — —  4 — 5 4 —	<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ - $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
	Poor Duller — Duller and weaker		<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron
	Salts as pigments See Leather Dyes section	See Leather Dyes section Hydrated creams Inks Mass coloration of casein Biological stain	<b>NON-TEXTILE USAGE</b>
	Fastness to milling, perspiration and washing is a little lower on silk than on wool		<b>NOTES</b>

# C.I. Acid Blue 21—26

C.I. Acid Blue	21	22	23
CHEMICAL CLASS	Monoazo	Triphenylmethane	Anthraquinone
C.I. CONSTITUTION NUMBER	18120	42755	61125
HUE			
Daylight	—	Blue	Greenish blue
Artificial light (tungsten)	—	—	Slightly duller
DYEING: WOOL			
Method	Acid bath	3	3
Levelling	—	—	—
S.D.C. migration test method/grade	—	—	II/2-3
Staining other fibres	—	—	Cellulose and acetate—u silk—ss
DYEING: OTHER FIBRES		Silk: sulphuric acid	Nylon: acetic or formic acid
PRINTING			Wool, silk and nylon: direct
FASTNESS PROPERTIES			
Method			AATCC ISO
Alkali			3 4
Carbonising			5 4-5
Chlorination — alteration			— 3
staining wool			— 4
Decatising			— 4-5
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal			— 5-6
normal			5-6 6
2 × normal			— 6
Milling, alkaline — alteration			1 1-2
staining wool			1 1-2
Milling, acid — alteration			3-4 3
staining wool			5 2
Peroxide bleaching — alteration			1 1
staining wool			1 2
Perspiration			3 3
Potting — alteration			3-4 2
staining wool			5 1
Sea water — alteration			4 3
staining wool			4 2
Stoving			5 4-5
Washing — alteration			4 3
staining wool			4 5
OTHER PROPERTIES			
Dischargeability			Poor
Effect of metals — copper			Slightly duller
chromium			Little effect
iron			Greener and duller
NON-TEXTILE USAGE		See Leather Dyes section Paper: beater dyeing Inks and fugitive marking inks Mass coloration of casein Salts as pigments for paper coating and rubber	Paper: surface colouring See Leather Dyes section
NOTES			

24	25	26	C.I. Acid Blue
Triphenylmethane 42730	Anthraquinone 62055	Triphenylmethane —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Blue Slightly redder	Blue Little change	Bright greenish blue Slightly duller	HUE Daylight Artificial light (tungsten)
3  Good — Acetate— <i>u</i> , cellulose— <i>ss</i>	3  Good — Acetate— <i>s</i> , cellulose— <i>u</i>	3  Good — Acetate and cellulose— <i>u</i>	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Silk: degumming liquor broken with acetic or formic acid	Nylon: neutral; formic acid for exhaustion if necessary. Good barré coverage Silk: acetic, formic or sulphuric acid	Nylon: acetic or formic acid Silk: acetic acid or neutral	DYEING: OTHER FIBRES
Wool and silk: direct	Wool, silk and acetate: direct	Wool and silk: direct	PRINTING
ISO  4 3-4 — 3-4  — 2 2  3 — 2 —  2 — 3 —  3 — 4 3 3	AATCC  4 4 — 4  4 4-5 5  1-2 — —  1-2 4 —  2 — 3 1-2 1-2	ISO  4 4-5 3 — 4-5  5 5-6 6  2 — 4 —  — — 3 — 4 3-4 4	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Moderate Duller and greener — Duller and weaker	Poor Little duller — Little duller	Good Slightly greener and duller — Much greener and duller	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
Salts as pigments	See Leather Dyes section Anodised aluminium Soap Bath salts	Paper: surface colouring See Leather Dyes section	NON-TEXTILE USAGE
On silk the fastness properties are similar to those on wool; the wet fastness properties are improved by tannin and tartar emetic aftertreatment	Fastness on nylon (ISO): Light 5-6, 6, 6; Perspiration 4-5; * Washing 4*  *Syntanned dyeings	Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—yellow	NOTES

# C.I. Acid Blue 27—31

C.I. Acid Blue	27	28	29
CHEMICAL CLASS	Anthraquinone	—	Disazo
C.I. CONSTITUTION NUMBER	61530	—	20460
HUE Daylight Artificial light (tungsten)	Greenish blue Redder and duller	Reddish blue Little change	Navy Slightly greener
DYEING: WOOL Method	2, 3	2, 3	2, 3
Levelling S.D.C. migration test method/grade Staining other fibres	Good — Acetate—ss, cellulose—u	Good — Acetate and cellulose—ss	Moderate to good — Acetate and cellulose—ss
DYEING: OTHER FIBRES	Nylon: neutral; formic acid for exhaustion if necessary. Good barré coverage Silk: acetic acid	Silk: acetic or sulphuric acid	Nylon: acid Silk: acetic acid
PRINTING	Wool: direct	Wool and silk: direct	Wool and silk: direct
FASTNESS PROPERTIES Method	AATCC* ISO	ISO	AATCC ISO
Alkali	4 4	5	3 5
Carbonising	3 4-5	4	5 4
Chlorination — alteration staining wool	— 1-2	—	— —
Decatising	4-5 4-5	5	2 5
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	3 4	1	— 5-6
normal	4 4-5	1	7-8 6
2 × normal	4 5	2	— 6-7
Milling, alkaline — alteration staining wool	1-2 2	—	1 1-2
Milling, acid — alteration staining wool	— 3	1	— —
Peroxide bleaching — alteration staining wool	1 2	4-5	— —
Perspiration	3 3-4	—	— —
Potting — alteration staining wool	— 3	3-4	1 1-2
Sea water — alteration staining wool	4 3-4	—	1 3
Stoving	4 4	5	4 4-5
Washing — alteration staining wool	1 2-3	4-5	2 2
OTHER PROPERTIES			
Dischargeability	Poor	Good	Moderate
Effect of metals — copper	Slightly greener and duller	Little change	Somewhat greener and weaker
chromium	—	—	Little effect
iron	Slightly greener and duller	Little change	Slightly greener
NON-TEXTILE USAGE	Paper: coating See Leather Dyes section		Casein: surface dyeing in an acid bath Paper: beater dyeing, surface colouring and brush dyeing See Leather Dyes section
NOTES	*On nylon: good washing fast- ness and excellent light fast- ness		



30	31	C.I. Acid Blue
Azo —	— —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Blue→navy (acetate); dull blue→navy (nylon) Duller	Reddish blue Redder	HUE Daylight Artificial light (tungsten)
	3  Moderate — Acetate and cellulose— <i>u</i> , silk— <i>ss</i>	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Acetate and nylon: neutral or weakly acid at 80–85°C. Suitable for package dyeing Silk and wool dyed more heavily than nylon Cellulose— <i>hs</i>		DYEING: OTHER FIBRES
	Wool and silk: direct	PRINTING
ISO Acetate      Nylon 4                — 2*             — —              — —              — 4†             —  2               3–4 3               4 3               4  —              — —              — —              — —              —  —              — —              — 4               5 —              — —              —  —              — —              — 3               4–5 —              —	ISO  2 4 4 — 4–5  1 2 2  2–3 3 —  2–3 3 4–5 — —  4 — 3 3–4 5	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ – $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Not dischargeable — — —	Poor — — —	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
Pastel dyeings on woolled sheepskins and furs		NON-TEXTILE USAGE
*Burnt gas fumes †Hot pressing Very sensitive to dry steaming  Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—dull violet		NOTES

**C.I. Acid Blue 32—37**

<b>C.I. Acid Blue</b>	<b>32</b>	<b>33</b>	<b>34</b>
<b>CHEMICAL CLASS</b>	—	Polyazo	Triphenylmethane
<b>C.I. CONSTITUTION NUMBER</b>	—	—	42561
<b>HUE</b> Daylight Artificial light (tungsten)	Bright greenish blue Greener	Bright blue No change	Bright blue Redder
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	3  Good — Acetate and cellulose— <i>u</i> silk— <i>hs</i>		3  Good — Acetate and cellulose— <i>u</i> nylon— <i>hs</i>
<b>DYEING: OTHER FIBRES</b>			Silk: acetic acid or neutral
<b>PRINTING</b>		Pure and tin-weighted silk	Wool: direct
<b>FASTNESS PROPERTIES</b> Method	ISO	AATCC Silk	AATCC
Alkali	3-4	—	4
Carbonising	4	—	3
Chlorination — alteration	—	—	—
staining wool	—	—	—
Decatising	4-5	—	—
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	1	—	1
normal	2	5	1-2
2 × normal	3	—	2
Milling, alkaline — alteration	2-3	—	1
staining wool	3	—	—
Milling, acid — alteration	3	—	—
staining wool	2-3	—	—
Peroxide bleaching — alteration	3	—	1
staining wool	3	—	—
Perspiration	3-4	1	1
Potting — alteration	—	—	—
staining wool	—	—	—
Sea water — alteration	3-4	—	3-4
staining wool	2-3	—	—
Stoving	4	—	2
Washing — alteration	2-3	4-5	2
staining wool	3	—	—
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Poor Duller Little effect Duller		Moderate Slightly greener and duller — Much greener and duller
<b>NON-TEXTILE USAGE</b>			Paper: surface colouring See Leather Dyes section
<b>NOTES</b>		Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—blue	Very good solubility in water

35	36	37	C.I. Acid Blue
Anthraquinone 61560	Azo (metallised) —	Anthraquinone —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Bright blue Greener		Blue Greener	HUE Daylight Artificial light (tungsten)
2, 3 Moderate — Acetate—s, cellulose—u		3 Good — Acetate—hs, cellulose—vss	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: acetic or formic acid Silk: acetic acid		Silk: acetic acid	DYEING: OTHER FIBRES
Wool and silk: direct		Wool and silk: direct	PRINTING
AATCC 3 5 — — 3 3-4 4 1 1 — — 1 1 — 3-4 5 2 2	ISO 3-4 4 3 — 4-5 5 5-6 6 6 3 3 5 — 3 3-4 — 3 4-5 3 3-4 4-5 3 3-4	ISO 4-5 4 3-4 5 5 5-6 6 6 2 2 — — 4 3 4-5 2 1 4-5 4 5 3 3	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Poor Greener and duller — Greener and duller		Poor Greener and duller — Greener and duller	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
Anodised aluminium Paper See Leather Dyes section	See Leather Dyes section		NON-TEXTILE USAGE
		Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—yellow	NOTES

# C.I. Acid Blue 38—41:1

C.I. Acid Blue	38	39	40
CHEMICAL CLASS	—	Azine	Anthraquinone
C.I. CONSTITUTION NUMBER	—	—	62125
HUE Daylight Artificial light (tungsten)	Bright greenish blue Duller	Reddish navy Little change	Greenish blue Slightly greener
DYEING: WOOL Method	3	3	3
Levelling S.D.C. migration test method/grade Staining other fibres	Good — Acetate— <i>s</i> , cotton— <i>u</i> , silk— <i>hs</i> , viscose— <i>s</i>	Good; can be salted at boil — Acetate— <i>ss</i> , cellulose— <i>u</i>	— 1/3-4 Acetate and cellulose— <i>u</i>
DYEING: OTHER FIBRES		Silk: acetic or sulphuric acid	Nylon: formic acid Silk: acetic, formic or sulphuric acid
PRINTING			Wool, silk and nylon: direct
FASTNESS PROPERTIES Method	ISO	ISO	AATCC ISO
Alkali	2-3	3	3-4 4
Carbonising	4	4	4 4-5
Chlorination — alteration	—	—	— 3-4
staining wool	—	—	— 4
Decatising	4-5	5	4 4-5
Light, 1/3-1/2 normal	1	3	4 5-6
normal	2	4	5 6
2 × normal	3	4-5	6 6-7
Milling, alkaline — alteration	1-2	—	1-2 1-2
staining wool	4	—	1-2 1-2
Milling, acid — alteration	3	2	— 3
staining wool	3	—	— 2
Peroxide bleaching — alteration	1	4-5	1 1-2
staining wool	4	—	1 1-2
Perspiration	3	3	2 3
Potting — alteration	—	—	— 2
staining wool	—	—	— 2
Sea water — alteration	3	—	2-3 3
staining wool	2	—	2-3 1-2
Stoving	3-4	5	4 4
Washing — alteration	2	3-4	1-2 2
staining wool	2-3	5	1-2 2
OTHER PROPERTIES			
Dischargeability	Moderate to good	Poor	Poor
Effect of metals — copper	Duller	Slight change	Little duller and greener
chromium	—	Little change	Little change
iron	Duller	Duller	Somewhat duller
NON-TEXTILE USAGE			See Leather Dyes section Paper: beater dyeing
NOTES		This dye is referred to in: BP 265986 GP 504331 USP 1850838 and 1850842	Fastness on nylon (ISO): Light 5, 5, 5; Perspiration 4*; Washing 4-5*  *Syntanned dyeings



40:1	41	41:1	C.I. Acid Blue																																														
— —	Anthraquinone 62130	Anthraquinone —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER																																														
— —	Blue Redder and duller	Blue Redder and duller	HUE Daylight Artificial light (tungsten)																																														
Slightly different chemically from C.I. Acid Blue 40 but similar in application and properties	3 — I/4-5 Acetate and cellulose—u	Chemically slightly different from C.I. Acid Blue 41 but similar in properties and usage	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres																																														
	Nylon: formic acid Silk: acetic acid		DYEING: OTHER FIBRES																																														
	Wool, silk and nylon: direct		PRINTING																																														
	<table><tr><td>AATCC</td><td>ISO</td></tr><tr><td>3-4</td><td>4-5</td></tr><tr><td>4</td><td>4</td></tr><tr><td>1</td><td>2-3</td></tr><tr><td>3</td><td>3-4</td></tr><tr><td>4</td><td>4</td></tr><tr><td>4-5</td><td>5</td></tr><tr><td>5</td><td>5-6</td></tr><tr><td>5-6</td><td>6</td></tr><tr><td>2</td><td>2</td></tr><tr><td>2</td><td>2</td></tr><tr><td>—</td><td>3</td></tr><tr><td>—</td><td>2</td></tr><tr><td>2</td><td>2</td></tr><tr><td>1</td><td>2</td></tr><tr><td>3</td><td>4</td></tr><tr><td>—</td><td>1-2</td></tr><tr><td>—</td><td>1-2</td></tr><tr><td>3</td><td>2-3</td></tr><tr><td>3</td><td>2-3</td></tr><tr><td>4</td><td>4</td></tr><tr><td>2</td><td>2</td></tr><tr><td>2</td><td>2</td></tr></table>	AATCC	ISO	3-4	4-5	4	4	1	2-3	3	3-4	4	4	4-5	5	5	5-6	5-6	6	2	2	2	2	—	3	—	2	2	2	1	2	3	4	—	1-2	—	1-2	3	2-3	3	2-3	4	4	2	2	2	2		FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool  Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
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	Poor Slightly duller — Redder and duller		OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron																																														
	Anodised aluminium Soap See Leather Dyes section		NON-TEXTILE USAGE																																														
			NOTES																																														

**C.I. Acid Blue 41:2—44**

[illegible]

43	44	C.I. Acid Blue
Anthraquinone 63000	Disazo 21640	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Blue Slightly greener	Reddish navy —	HUE Daylight Artificial light (tungsten)
3 — I/3 Acetate and cellulose—ss	3 Moderate — Acetate and cellulose—u	DYEING: WOOL Method Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: formic or sulphuric acid Silk: formic or sulphuric acid		DYEING: OTHER FIBRES
Wool and silk: direct	Wool and silk: discharge print styles	PRINTING
AATCC      ISO	ISO	FASTNESS PROPERTIES Method
3      3-4	2-3	Alkali
3      3-4	4-5	Carbonising
—      3-4	—	Chlorination — alteration staining wool
—      4	—	Decatising
5      4-5	4-5	
3      4-5	4	Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal
4      5	4-5	normal
5      5-6	5	2 × normal
1      1	1	Milling, alkaline — alteration staining wool
1      1	2	Milling, acid — alteration staining wool
—      2	—	
—      1-2	—	
1      1-2	1	Peroxide bleaching — alteration staining wool
1      1-2	—	
2      2-3	2	Perspiration
—      1	—	Potting — alteration staining wool
—      1	—	
2      2	2-3	Sea water — alteration staining wool
2      1-2	—	
4      4	1	Stoving
1-2      2	2	Washing — alteration staining wool
1-2      1-2	3	
Poor Slightly greener — Somewhat duller	Moderate to good — Little changed —	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
Barium salt has good fastness to light and fair covering power for wallpaper, book and lithographic inks Paper: beater dyeing and coating Anodised aluminium Ivory buttons See Leather Dyes section		NON-TEXTILE USAGE
	When afterchromed the shade is little changed, light fastness is not improved but fastness to milling, perspiration and washing is much improved	NOTES

**C.I. Acid Blue 45—49**

<b>C.I. Acid Blue</b>	<b>45</b>	<b>46</b>
<b>CHEMICAL CLASS</b>	Anthraquinone	Anthraquinone
<b>C.I. CONSTITUTION NUMBER</b>	63010	—
<b>HUE</b> Daylight Artificial light (tungsten)	Blue Slightly greener	Blue Duller
<b>DYEING: WOOL</b> Method	3	3
Levelling S.D.C. migration test method/grade Staining other fibres	— I/2-3 Acetate and cellulose— <i>u</i> , nylon— <i>d</i>	Good — Acetate and cellulose— <i>u</i> , nylon— <i>d</i> , silk— <i>hs</i>
<b>DYEING: OTHER FIBRES</b>	Silk: formic acid	
<b>PRINTING</b>		Nylon: direct
<b>FASTNESS PROPERTIES</b> Method	AATCC	AATCC
Alkali	2	4
Carbonising	3	4
Chlorination — alteration	—	2-3
staining wool	—	3-4
Decatising	5	4-5
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	4	5
normal	4	5-6
2 × normal	5	6
Milling, alkaline — alteration	1	1
staining wool	1	1
Milling, acid — alteration	—	2
staining wool	—	1-2
Peroxide bleaching — alteration	1	1-2
staining wool	1	1-2
Perspiration	2	2-3
Potting — alteration	—	1
staining wool	—	1
Sea water — alteration	2-3	2
staining wool	2-3	1-2
Stoving	4	3-4
Washing — alteration	1-2	2
staining wool	1-2	3-4
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Poor Slightly duller — Slightly redder and duller	— Greener and brighter — Slightly greener
<b>NON-TEXTILE USAGE</b>	Heavy metal salts as pigments for printing inks, book cloths and wallpaper Paper: beater dyeing and coating Anodised aluminium Urea, melamine and nitrocellulose plastics Soap and cosmetics See Leather Dyes section	Leather: on vegetable, chrome and semi-chrome tannages Paper: surface colouring
<b>NOTES</b>		<b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—dark bluish green



47	48	49	C.I. Acid Blue
Anthraquinone 62085	Triphenylmethane 42770	Anthraquinone 62095	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Blue Slightly redder	Blue (silk) —	Blue Little change	HUE Daylight Artificial light (tungsten)
2, 3  — I/3-4 Acetate— <i>ss</i> , cellulose— <i>u</i>	—	3  Moderate — Acetate— <i>ss</i> , cellulose— <i>u</i>	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: acid bath Silk: acetic acid	Silk: weakly acid or neutral; moderate levelling		DYEING: OTHER FIBRES
Wool, silk and nylon: direct	Wool, silk and viscose: direct	Wool and silk: direct	PRINTING
AATCC 3 4 — — 4  4 4 4  2 2 — —  2 2 3 — —  2 2 4 2 2	ISO 4-5 4 3 4 4  5 5 5  1 1 3 2  1 1 3-4 1 1  3-4 2 4 2 2	ISO Silk 1 — — — —  — 3 —  1 — — —  — 2 — — —  3 — 2-3 — —	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Poor Slightly duller Little effect Duller		Moderate Slightly duller — Duller	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
See Leather Dyes section Heavy metal salts as pig- ments for coloured pencils Anodised aluminium Paper Soap Wood stains	Inks, paper and in the man- ufacture of C.I. Pigment Blue 18	Casein buttons Soap Wallpaper Wood stains	NON-TEXTILE USAGE
			NOTES

# C.I. Acid Blue 50—55

C.I. Acid Blue	50	51	52	
CHEMICAL CLASS	Anthraquinone	Anthraquinone	Anthraquinone	
C.I. CONSTITUTION NUMBER	—	62145	—	
HUE Daylight Artificial light (tungsten)	Blue Slightly greener	Blue Slightly redder	Greenish blue Slightly greener	
DYEING: WOOL Method	3	2, 3	3	
Levelling S.D.C. migration test method/grade Staining other fibres	— I/2 Acetate and cellulose— <i>u</i> , silk— <i>ss</i>	Good — Acetate— <i>ss</i> , cellulose— <i>u</i>	— I/2-3 Acetate and cellulose— <i>u</i>	
DYEING: OTHER FIBRES		Nylon: sulphuric acid Silk: broken soap liquor	Nylon: acetic or formic acid Silk (unweighted only)	
PRINTING	Wool and silk: direct	Wool and silk: direct	Wool and silk: direct	
FASTNESS PROPERTIES Method	AATCC	ISO	AATCC	ISO
Alkali	5	4-5	3	4
Carbonising	4	4-5	3	4-5
Chlorination — alteration	—	3-4	—	—
staining wool	—	4	—	3
Decatising	—	4	3	5
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	4-5	5	—	—
normal	5	5-6	6-7	6
2 × normal	5-6	6	—	7
Milling, alkaline — alteration	3	1	2	2-3
staining wool	3	2-3	—	—
Milling, acid — alteration	—	3-4	—	—
staining wool	—	2-3	—	—
Peroxide bleaching — alteration	—	1	—	1
staining wool	—	1	—	1
Perspiration	4	3	3-4	3
Potting — alteration	—	1	—	1
staining wool	—	1	—	1
Sea water — alteration	3-4	2	2	3-4
staining wool	3-4	2	—	—
Stoving	5	4	3-4	4-5
Washing — alteration	4-5	2	2-3	2-3
staining wool	4-5	3-4	2-3	2-3
OTHER PROPERTIES				
Dischargeability	Poor	Poor	Poor	Poor
Effect of metals — copper	Little duller	Slightly greener and duller	Slightly duller	Slightly duller
chromium	Little change	Little effect	—	—
iron	Duller	Slightly duller	Slightly duller	Slightly duller
NON-TEXTILE USAGE		Casein plastics: surface dyeing in an acid bath See Leather Dyes section	See Leather Dyes section	
NOTES	Reactions in substance H <sub>2</sub> SO <sub>4</sub> conc.—greenish black			

<b>53</b>	<b>54</b>	<b>55</b>	<b>C.I. Acid Blue</b>
Anthraquinone <b>62135</b>	Anthraquinone —	Anthraquinone <b>63315</b>	<b>CHEMICAL CLASS</b> <b>C.I. CONSTITUTION NUMBER</b>
Blue Slightly redder	Bright blue Slightly greener and duller	Blue Greener	<b>HUE</b> Daylight Artificial light (tungsten)
2, 3  Good; can be salted at boil — Acetate—ss, cellulose—u	3  II/1-2 Acetate and cellulose—u	3  I/3 Acetate and cellulose—u	<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres
	Nylon: acetic or sulphuric acid Silk: acetic or sulphuric acid	Nylon: acetic or formic acid Silk: acetic or formic acid	<b>DYEING: OTHER FIBRES</b>
Wool and silk: direct	Wool and silk: direct	Wool and silk: direct	<b>PRINTING</b>
<b>ISO</b>  1 4 — — 4  5 5-6 6  2 — 1-2 —  3 — 2-3 — —  2-3 — 2-3 2-3 2-3	<b>AATCC</b>  4-5 4 2-3 2-3 4-5  3-4 4-5 5  3 3 — —  — — 3-4 — —  3 3 4-5 3-4 3-4	<b>ISO</b>  3 4 2 2 2 4  5 5-6 6  1 1 1 2 1  1 1 3 1 1  3 2 4 2 1	<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{8}$ - $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Moderate Much duller Little effect Much duller	Poor Somewhat duller — Somewhat duller	Poor Greener and duller — Greener and duller	<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron
Paper: beater dyeing		Anodised aluminium Paper See Leather Dyes section	<b>NON-TEXTILE USAGE</b>
	<b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—olive		<b>NOTES</b>

**C.I. Acid Blue 56—61**

<b>C.I. Acid Blue</b>	<b>56</b>	<b>57</b>	<b>58</b>
<b>CHEMICAL CLASS</b>	Anthraquinone	Anthraquinone	Anthraquinone
<b>C.I. CONSTITUTION NUMBER</b>	62005	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Reddish blue Somewhat redder	Reddish blue Slightly redder	Greenish blue Greener and duller
<b>DYEING: WOOL</b> Method	1, 2, 3	2, 3	3
Levelling S.D.C. migration test method/grade Staining other fibres	Good — Acetate— <i>ss</i> , cellulose— <i>u</i>	— I/2 Acetate— <i>hs</i> , cotton— <i>u</i> , silk and viscose— <i>ss</i>	Good — Acetate and cellulose— <i>u</i> , silk— <i>hs</i>
<b>DYEING: OTHER FIBRES</b>	Silk: broken degumming liquor	Silk (unweighted only): acid bath	Nylon: formic acid
<b>PRINTING</b>	Wool and silk: direct		Nylon: direct
<b>FASTNESS PROPERTIES</b> Method	ISO	ISO	AATCC Wool Nylon
Alkali	4	5	3 —
Carbonising	3	3-4	4 —
Chlorination — alteration	—	3	— —
staining wool	—	4	— —
Decatising	3	3	— 5*
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal	5	5-6	— —
normal	5-6	6	4-5 4
2 × normal	6	6-7	— —
Milling, alkaline — alteration	1	1	1-2 III/2
staining wool	—	1	— —
Milling, acid — alteration	1	3	— —
staining wool	—	2	— —
Peroxide bleaching — alteration	—	1	3 3
staining wool	—	1	— —
Perspiration	3	3-4	3 5
Potting — alteration	—	1	— —
staining wool	—	1	— —
Sea water — alteration	1-2	3	5 4-5
staining wool	—	1	— —
Stoving	4	3-4	4-5 —
Washing — alteration	1-2	1	1 III/4
staining wool	3	3	— —
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Poor Slightly duller — Slightly duller	Poor Duller Little effect Duller	
<b>NON-TEXTILE USAGE</b>			Leather: on vegetable, chrome and semi-chrome tannages
<b>NOTES</b>			*Sublimation Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—dull green



59	60	61	C.I. Acid Blue	
Azine 50315	Polyazo —	Azine 50330	CHEMICAL CLASS C.I. CONSTITUTION NUMBER	
Reddish blue Redder	Blue→navy —	Blue Slightly redder and duller	HUE Daylight Artificial light (tungsten)	
2  — II/3 Acetate and cellulose—ss		2  — III/3-4 Acetate and cellulose—ss, nylon—s	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres	
Nylon: formic acid Silk: acetic acid or neutral Coir Sisal		Silk: acetic acid or neutral	DYEING: OTHER FIBRES	
Wool, silk and nylon: direct		Wool and silk: direct	PRINTING	
AATCC 4 3-4 — — 5  2 3 4  4 4 — —  1 1 3-4 — —  4-5 4-5 5 2-3 2-3	ISO 5 3-4 3-4 4 4  3 4 4  2-3 2-3 2 2  1 1 4 1 1  4 3 4 2-3 2-3	AATCC 4 4 5 5 5  3 4 4-5  4 4 — —  1 1 4-5 — —  4-5 4-5 5 4 4	ISO 4 3 4 4 4  3 4 4  2-3 2-3 2-3 2  3 1 4 2 1  4 3 4-5 3 2	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, 1/3-1/2 normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Poor Slightly duller — Duller		Poor Slightly duller Little effect Duller	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron	
See Leather Dyes section Nitrocellulose lacquers Wood stains Heavy metal salts as pigments for paper coating	See Leather Dyes section	Paper Plastics Soap Salts as pigments See Leather Dyes section	NON-TEXTILE USAGE	
	Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—blue		NOTES	

# C.I. Acid Blue 61:1—65

C.I. Acid Blue	61:1	62	62:1
CHEMICAL CLASS	Azine	Anthraquinone	Anthraquinone
C.I. CONSTITUTION NUMBER	—	62045	—
HUE Daylight Artificial light (tungsten)	Blue —	Bright reddish blue Little change	— —
DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres	Differs slightly chemically from C.I. Acid Blue 61 but is similar in properties and usage	2, 3  Moderate — Acetate— <i>ss</i> , cellulose— <i>u</i>	Slightly different chemically from C.I. Acid Blue 62 but similar in properties and usage
DYEING: OTHER FIBRES		Silk: broken degumming liquor or neutral Nylon: good barré coverage	
PRINTING		Wool and silk: direct	
FASTNESS PROPERTIES Method		AATCC	ISO
Alkali		3-4	3
Carbonising		3	4
Chlorination — alteration staining wool		1 —	— —
Decatising		4-5	4
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal		3-4 4 5	4-5 5 5-6
Milling, alkaline — alteration staining wool		2-3 —	2-3 —
Milling, acid — alteration staining wool		— —	3 —
Peroxide bleaching — alteration staining wool		3 —	1 —
Perspiration		—	3-4
Potting — alteration staining wool		— —	— —
Sea water — alteration staining wool		4 —	2 —
Stoving		—	4
Washing — alteration staining wool		— —	2-3 2-3
OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron		Moderate Somewhat duller — Duller	
NON-TEXTILE USAGE		Leather: on chrome and synthetic tannage	
NOTES		*Wool nylon unions: medium and deep dyeings uniform; nylon more heavily dyed than wool in light dyeings	

63	64	65	C.I. Acid Blue
Anthraquinone —	Anthraquinone —	Anthraquinone —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Blue Much greener and slightly duller	Blue Slightly duller	Bright reddish blue Redder	HUE Daylight Artificial light (tungsten)
3  Moderate — Acetate and cellulose— <i>u</i>	3  Moderate — Acetate and cellulose— <i>u</i> , silk— <i>s</i>	2, 3  — — Acetate— <i>hs</i> , cellulose— <i>ss</i> , silk— <i>d</i>	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: acetic or formic acid Silk: acetic acid or neutral	Nylon: acetic or formic acid	Nylon: formic acid	DYEING: OTHER FIBRES
Wool and silk: direct	Wool: direct		PRINTING
AATCC  1 4 — —  3 3-4 4  1 — —  2 — 2-3 3 —  3 — 5 1 —	AATCC  3 3 — —  — 5-6 —  1 — —  1 — —  1 — —  4 — 5 1 —	AATCC Wool      Nylon —      — 3      — —      — —      — —      5*  —      — 4-5      3 —      —  1-2      III/2 —      — —      — —      —  —      2-3 —      — 3      4 —      — —      —  1      — —      — —      — 1-2      II/4-5 —      —	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Poor Slightly duller — Much duller	Poor Slightly greener — Much greener and duller	Poor (on nylon) Slightly duller — Much duller	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
			NON-TEXTILE USAGE
Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—yellowish olive	Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—purple	Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—bright reddish violet  *Sublimation	NOTES

# C.I. Acid Blue 66—71

C.I. Acid Blue	66	67	68
<b>CHEMICAL CLASS</b>	—	—	Anthraquinone
<b>C.I. CONSTITUTION NUMBER</b>	—	—	63330
<b>HUE</b> Daylight Artificial light (tungsten)	Blue Duller	Blue Redder and duller	Blue Duller
<b>DYEING: WOOL</b> Method	3	2, 3	3
Levelling S.D.C. migration test method/grade Staining other fibres	Good — Acetate and cellulose— <i>u</i> , silk— <i>hs</i>	Good — Acetate and cellulose— <i>u</i>	Good — Acetate— <i>s</i> , cellulose— <i>s</i>
<b>DYEING: OTHER FIBRES</b>		Nylon: formic acid Silk: acetic or formic acid	
<b>PRINTING</b>		Wool, silk and nylon: direct	
<b>FASTNESS PROPERTIES</b> Method	ISO	AATCC	ISO
Alkali	4	3-4	3
Carbonising	4	3	2-3
Chlorination — alteration	—	—	—
staining wool	—	—	—
Decatising	4	4	3
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal	5-6	4	5
normal	6	4-5	5-6
2× normal	6	5	6
Milling, alkaline — alteration	2	1-2	2-3
staining wool	2	—	2
Milling, acid — alteration	3	—	3
staining wool	1-2	—	1-2
Peroxide bleaching — alteration	2	1	1
staining wool	1	—	1
Perspiration	3-4	2-3	2
Potting — alteration	—	—	—
staining wool	—	—	—
Sea water — alteration	3-4	2-3	3
staining wool	2	—	2-3
Stoving	4	4	4
Washing — alteration	3	1-2	3
staining wool	3	1-2	2-3
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Poor Slightly duller — Slightly duller	Moderate Slightly duller — Greener and duller	Poor Duller — Much duller
<b>NON-TEXTILE USAGE</b>		See Leather Dyes section Paper: pulp dyeing or tissue staining Soap Salts as pigments for paper coating	
<b>NOTES</b>			



69	70	71	C.I. Acid Blue
Anthraquinone —	Monoazo  17000	—  —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Blue Slightly duller	Greenish blue —	Blue Duller	HUE Daylight Artificial light (tungsten)
3  Good — Acetate and cellulose— <i>u</i> , silk— <i>s</i>	1, 2  Moderate — Acetate and cellulose— <i>u</i> , silk— <i>ss</i>	3  Good — Acetate and cellulose— <i>vss</i>	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: formic acid		Nylon and silk: acid bath	DYEING: OTHER FIBRES
		Wool, silk and nylon: direct	PRINTING
AATCC                  ISO	ISO	ISO	FASTNESS PROPERTIES Method
2 2-3 — 5  4 4-5 5  1 — — —  1 — 1 —  2 — 4 1 —	3 4-5 — 5  5 5-6 6  1-2 — — —  — — 2 — — 3 — 3 —	3-4 4 — 3  — 4 — 2 —  2 — 2 — 3 — 3 — 3 — 1 2	Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ - $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Poor Greener and slightly duller — Slightly redder and duller	Poor to moderate — — —	Poor Duller and little greener — Duller and little greener	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
Anodised aluminium Paper See Leather Dyes section			NON-TEXTILE USAGE
			NOTES

**C.I. Acid Blue 72—77**

<b>C.I. Acid Blue</b>	<b>72</b>	<b>73</b>	<b>74</b>
<b>CHEMICAL CLASS</b>	—	Disazo	Indigoid
<b>C.I. CONSTITUTION NUMBER</b>	—	—	73015
<b>HUE</b> Daylight Artificial light (tungsten)	Blue Little change	Greenish navy Redder	Greenish blue Somewhat greener
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	1, 2, 3  — I/3-4 Acetate and cellulose— <i>ss</i> , silk— <i>hs</i>	2  Moderate — Acetate and cellulose— <i>u</i> , nylon and silk— <i>ss</i>	3  — I/4 Acetate and cellulose— <i>vss</i> , nylon— <i>hs</i>
<b>DYEING: OTHER FIBRES</b>	Nylon		Silk: formic or sulphuric acid
<b>PRINTING</b>			Wool and nylon: direct
<b>FASTNESS PROPERTIES</b> Method	ISO	AATCC	AATCC      ISO
Alkali	4-5	5	1      2-3
Carbonising	4-5	4-5	4      3-4
Chlorination — alteration	—	—	—      3
staining wool	—	—	—      5
Decatising	5	4-5	3-4      4
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	5	—	1      1
normal	5-6	5-6	1      1-2
2 × normal	6	—	2      2-3
Milling, alkaline — alteration	1	3-4	1      1
staining wool	1	—	1      1
Milling, acid — alteration	4	—	—      1-2
staining wool	4	—	—      1-2
Peroxide bleaching — alteration	—	—	1      1
staining wool	—	—	1      2
Perspiration	4	4	1      2
Potting — alteration	—	—	—      1
staining wool	—	—	—      1
Sea water — alteration	—	5	2      2
staining wool	—	—	2      1
Stoving	5	—	3      4
Washing — alteration	2	3-4	3      2
staining wool	3-4	—	5      4
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	— Duller — —	Moderate to good Duller Unaffected Duller	Poor Little greener and duller — Duller
<b>NON-TEXTILE USAGE</b>	See Leather Dyes section	See Leather Dyes section	Biological stain Cosmetics. Indicator See C.I. Food Blue 1 See Leather Dyes section
<b>NOTES</b>	Fastness on nylon (ISO): Light 5-6, 5-6, 6; Pers- piration 4*; Washing 4*  *Syntanned dyeings	<b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—bluish green  For use as an afterchrome dye see C.I. Mordant Blue 82	

75		76	77	C.I. Acid Blue
Triphenylmethane 42576		— —	— —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Violet blue Redder and duller		Blue Duller and redder	Blue Duller and redder	HUE Daylight Artificial light (tungsten)
2, 3 — Moderate to good — Acetate and cellulose— <i>s</i> , nylon— <i>d</i>		3 — Good — Acetate— <i>s</i> , cellulose— <i>u</i> , silk— <i>hs</i>	3 — Moderate — Acetate and cellulose— <i>u</i> , silk— <i>s</i>	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Silk: acetic or sulphuric acid				DYEING: OTHER FIBRES
Wool, silk and nylon: direct				PRINTING
AATCC	ISO	ISO	ISO	FASTNESS PROPERTIES Method
1	5	4	4	Alkali
4	4	4	3-4	Carbonising
—	—	—	—	Chlorination — alteration staining wool
—	5	4	4	Decatising
1	1	5-6	5-6	Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal
1	2	6	5-6	normal
1	2	6	6	2 × normal
3	—	2-3	2	Milling, alkaline — alteration staining wool
—	—	2-3	2	Milling, acid — alteration staining wool
—	1	2	3	
—	—	2	2	
1	4-5	3-4	1-2	Peroxide bleaching — alteration staining wool
—	—	2	1-2	
4	3	3-4	3-4	Perspiration
—	—	—	—	Potting — alteration staining wool
—	—	—	—	
2	—	3	3-4	Sea water — alteration staining wool
—	—	2-3	2-3	
5	5	4	3-4	Stoving
3	3-4	2-3	3	Washing — alteration staining wool
3	5	3	3	
Moderate Little duller — Little duller		Poor Slightly duller Little effect Slightly duller	Poor Duller Little effect Slightly duller	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
Paper Soap See Leather Dyes section				NON-TEXTILE USAGE
				NOTES

C.I. Acid Blue	78	79	80			
CHEMICAL CLASS	Anthraquinone	Anthraquinone	Anthraquinone			
C.I. CONSTITUTION NUMBER	62105	—	61585			
HUE Daylight Artificial light (tungsten)	Blue Slightly redder	Blue Greener and duller	Blue Slightly redder			
DYEING: WOOL Method	2	3	2			
Levelling S.D.C. migration test method/grade Staining other fibres	Moderate to good — Acetate— <i>ss</i> , cellulose— <i>u</i>	Good — Acetate and cellulose— <i>u</i> , silk— <i>hs</i>	— III/1 Cellulose— <i>u</i>			
DYEING: OTHER FIBRES	Nylon: formic acid Silk: acetic acid or neutral	Nylon: acetic or formic acid	Silk: acetic acid Nylon			
PRINTING		Nylon: direct	Wool and silk: direct			
FASTNESS PROPERTIES Method	AATCC	ISO	AATCC	ISO		
Alkali	2-3	4	Wool 3	—	5	5
Carbonising	4	4-5	4	—	5	5
Chlorination — alteration	1	3	—	—	4	3-4
staining wool	—	—	—	—	4	4
Decatising	4	5	—	5*	5	5
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal	4	5	4	—	4-5	5-6
normal	5	5-6	4	4	4-5	6
2 × normal	6	6	5	—	5	6-7
Milling, alkaline — alteration	2	3-4	1	III/2	3-4	3
staining wool	—	—	—	—	3-4	3-4
Milling, acid — alteration	—	3	3	2	—	4
staining wool	—	—	—	—	—	5
Peroxide bleaching — alteration	2-3	2	—	—	—	3-4
staining wool	—	—	—	—	—	2
Perspiration	4	3-4	2	5	4-5	4
Potting — alteration	—	2-3	—	—	—	1
staining wool	—	—	—	—	—	1
Sea water — alteration	4	3-4	5	4	4-5	4
staining wool	—	—	—	—	4-5	2
Stoving	4-5	4-5	4	—	5	4-5
Washing — alteration	3	3	1	III/3	4-5	3
staining wool	2	3	—	—	4-5	4
OTHER PROPERTIES						
Dischargeability	Poor		Moderate (on nylon)		Poor	
Effect of metals — copper	Slightly duller		Slightly greener (on wool)		Slightly duller	
chromium	Little effect		Little effect		Little effect	
iron	Greener and duller		Unchanged		Much duller	
NON-TEXTILE USAGE	Anodised aluminium Paper: coating See Leather Dyes section		Leather: on vegetable, chrome and semi-chrome tannages			
NOTES			Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—bluish green *Sublimation		Fastness on nylon (ISO): Light 5-6, 6, 7; Perspira- tion 4-5; Washing 4-5	



81	82	83	C.I. Acid Blue
Anthraquinone 64515	— —	Triphenylmethane 42660	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Dull greenish blue Little greener and brighter	Blue Slightly greener	Bright blue Redder	HUE Daylight Artificial light (tungsten)
2, 3 Moderate — Acetate—s, cellulose—ss	2 — III/2 Acetate and cellulose—u	1, 2 — IV/2 Acetate and cellulose—ss	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: acetic or formic acid Silk: broken degumming liquor	Silk (unweighted): acetic acid Silk (weighted): in the degumming liquor Nylon	Nylon: formic acid Silk: acetic acid or neutral Feathers Straw	DYEING: OTHER FIBRES
Wool and silk: direct	Direct on wool	Wool, silk and viscose: direct	PRINTING
AATCC      ISO	AATCC      ISO	AATCC      ISO	FASTNESS PROPERTIES Method
4      5	3-4      4	3-4      3	Alkali
4      4	4-5      4	3      3	Carbonising
—      —	—      3-4	3      3	Chlorination — alteration
—      —	—      3-4	—      3	staining wool
4      4	4      4	5      4	Decatising
5      5-6	3-4      5	2      2	Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal
5-6      5-6	4      5-6	2-3      3	normal
6      6	4-5      6	3      3	2 × normal
3-4      2	2-3      2	2-3      2	Milling, alkaline — alteration
—      —	2-3      2	2-3      4-5	staining wool
—      —	—      3	—      3	Milling, acid — alteration
—      —	—      2	—      2	staining wool
—      2	—      1	1      1	Peroxide bleaching — alteration
—      —	—      1	1-2      1-2	staining wool
5      4	3-4      3-4	4-5      4	Perspiration
—      —	—      1	—      2	Potting — alteration
—      —	—      1	—      1	staining wool
3      4	3-4      3-4	4-5      4	Sea water — alteration
—      —	3-4      1	4-5      4-5	staining wool
3      3	4-5      4	4      3	Stoving
2-3      2	4-5      2	3-4      4	Washing — alteration
2-3      3	4-5      1	3-4      4	staining wool
Poor to moderate Little change — Little change	Poor Little duller Little effect Little duller	Good Duller Little effect Duller	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
	See Leather Dyes section	See Leather Dyes section Paper: coating and surface colouring	NON-TEXTILE USAGE
			NOTES

# C.I. Acid Blue 84—89

C.I. Acid Blue	84	85	86
CHEMICAL CLASS	Triphenylmethane	Disazo	Triphenylmethane
C.I. CONSTITUTION NUMBER	—	25735	44075
HUE Daylight Artificial light (tungsten)	Bright reddish blue Redder	Reddish navy Redder	Blue Somewhat greener
DYEING: WOOL Method	2	1, 2	2, 3
Levelling S.D.C. migration test method/grade Staining other fibres	Moderate — Acetate— <i>u</i> , cellulose— <i>ss</i>	Good — Acetate and cellulose— <i>ss</i>	Moderate — Acetate and cellulose— <i>ss</i>
DYEING: OTHER FIBRES	Silk: acetic acid or neutral	Silk: acetic acid or neutral	Silk: degumming liquor broken with acetic acid
PRINTING			Wool and silk: direct
FASTNESS PROPERTIES Method	ISO	ISO	ISO
Alkali	4-5	4	3-4
Carbonising	4-5	4	4
Chlorination — alteration staining wool	— —	— —	— —
Decatising	5	2-3	4
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	1	2	1
normal	2	2	2
2 × normal	2	3	2
Milling, alkaline — alteration staining wool	4 —	3 —	3 —
Milling, acid — alteration staining wool	— —	— —	— —
Peroxide bleaching — alteration staining wool	— —	— —	1 —
Perspiration	4	4	3
Potting — alteration staining wool	— —	— —	1-2 —
Sea water — alteration staining wool	4 —	4 —	2-3 —
Stoving	4-5	1	3-4
Washing — alteration staining wool	4-5 —	4 —	3 —
OTHER PROPERTIES			
Dischargeability	Poor	Good	Poor
Effect of metals — copper	Little change	Little change	Slightly duller
chromium	Little change	—	—
iron	Slightly duller	Slightly duller	Slightly duller
NON-TEXTILE USAGE	Salts as pigments		Feathers Salts as pigments for writing inks, stamps and wood stains See Leather Dyes section
NOTES	Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—yellow		Very good solubility in water

87	88	89	C.I. Acid Blue	
Disazo 20415	Triphenylmethane 44060	Monoazo 13405	CHEMICAL CLASS C.I. CONSTITUTION NUMBER	
Navy Bluer and brighter	Reddish blue Slightly greener	Reddish blue Little redder and duller	HUE Daylight Artificial light (tungsten)	
1, 2  Moderate — Acetate—u, cellulose—ss	2  Moderate — Acetate and cellulose—ss	2  Moderate — Acetate and cellulose—u	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres	
	Silk: degumming liquor broken with acetic acid	Nylon: acetic or formic acid Silk: degumming liquor broken with acetic acid	DYEING: OTHER FIBRES	
Wool: discharge styles	Wool and silk: direct	Wool and silk: direct	PRINTING	
ISO 4-5 5 — 5  — 3-4 4  2 — — —  — — 3 — —  4 — 4 2-3 —	ISO 4-5 5 — — 4-5  1 2 2  3 — — —  1 — 3-4 1-2 —  3 — 4 3 3-4	AATCC 3 3 — — 4  4 4 5  2 — — —  4 — 4 — —  2 — 1 2 2	ISO 4 4-5 1 — 4  4-5 5 5-6  2-3 — 4 —  3 — 3 3 —  3 — 1 3 3	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, 1/3-1/2 normal normal 2 x normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Very good Little change — Little change	Poor Little duller — Much duller	Poor Slightly greener and duller — Slightly greener and duller	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron	
	Salts as pigments for inks and wood stains Leather	See Leather Dyes section Paper: beater tinting and surface coating and colour- ing	NON-TEXTILE USAGE	
Poor solubility in water		Very good solubility in water	NOTES	

# C.I. Acid Blue 90—94

C.I. Acid Blue	90	90:1	91
<b>CHEMICAL CLASS</b>	Triphenylmethane	Triphenylmethane	Triphenylmethane
<b>C.I. CONSTITUTION NUMBER</b>	42655	—	42715
<b>HUE</b> Daylight Artificial light (tungsten)	Bright blue Slightly duller and greener		Blue Little change
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	2  — IV/2 Acetate and cellulose—u	Somewhat different chemically from C.I. Acid Blue 90 but closely similar in application and properties	2  Good — Acetate and cellulose—ss
<b>DYEING: OTHER FIBRES</b>	Nylon: formic acid Silk: acetic acid or neutral		Silk: neutral
<b>PRINTING</b>	Wool, silk and viscose: direct		Wool and silk: discharge styles
<b>FASTNESS PROPERTIES</b> Method	AATCC	ISO	ISO
Alkali	3	3	—
Carbonising	4	3-4	—
Chlorination — alteration	—	4	—
staining wool	—	5	—
Decatising	5	4	—
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal	2	2	2
normal	3	3	2
2 × normal	4	3	3
Milling, alkaline — alteration	2-3	3	—
staining wool	2-3	4-5	—
Milling, acid — alteration	—	3-4	—
staining wool	—	2-3	—
Peroxide bleaching — alteration	1	1	—
staining wool	1	1	—
Perspiration	4-5	3-4	4
Potting — alteration	—	2	—
staining wool	—	1	—
Sea water — alteration	4-5	4	4
staining wool	4-5	4	—
Stoving	4	4-5	3-4
Washing — alteration	3-4	3	4
staining wool	3-4	4-5	3-4
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Good Greener and duller Little effect Duller		Very good Somewhat duller — Somewhat duller
<b>NON-TEXTILE USAGE</b>	Paper: coating and surface colouring See Leather Dyes section		
<b>NOTES</b>	Moderate solubility in water		Very good solubility in water





# C.I. Acid Blue 95—100

C.I. Acid Blue	95	96	97
<b>CHEMICAL CLASS</b>	Monoazo	Anthraquinone	—
<b>C.I. CONSTITUTION NUMBER</b>	—	62110	—
<b>HUE</b> Daylight Artificial light (tungsten)	Reddish navy Redder	Dull blue —	Bright blue Somewhat greener
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	2  Moderate — Acetate and cellulose—ss	2  Moderate — —	2  Moderate — Acetate and cellulose—ss
<b>DYEING: OTHER FIBRES</b>	Silk: acetic acid	Silk: acetic acid	Silk: degumming liquor broken with acetic acid
<b>PRINTING</b>	Wool: direct	Wool and silk: direct	Wool and silk: direct
<b>FASTNESS PROPERTIES</b> Method	ISO	ISO	ISO
Alkali	4	4	4-5
Carbonising	5	5	5
Chlorination — alteration staining wool	— —	— —	— —
Decatising	3	4-5	4-5
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal	— 4-5 5	— 6-7 —	1 2 2
Milling, alkaline — alteration staining wool	1-2 —	2-3 —	3 —
Milling, acid — alteration staining wool	— —	— —	— —
Peroxide bleaching — alteration staining wool	— —	1 —	1 —
Perspiration	3	3	3-4
Potting — alteration staining wool	— —	— —	1-2 —
Sea water — alteration staining wool	3 —	3 —	4 —
Stoving	5	4	4
Washing — alteration staining wool	2 —	3 3	3 3-4
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Good Somewhat duller — Somewhat duller	Moderate Somewhat greener and duller — Somewhat greener and duller	Poor Somewhat greener — Little change
<b>NON-TEXTILE USAGE</b>		For use as a solvent dye see C.I. Solvent Blue 68	Salts as pigments for inks and wood stains See Leather Dyes section
<b>NOTES</b>	<b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—reddish violet	Good solubility in water	

98	99	100	C.I. Acid Blue	
Azine 50335	Triphenylmethane —	Triphenylmethane 42675	CHEMICAL CLASS C.I. CONSTITUTION NUMBER	
Reddish navy Slightly redder and duller	Bright blue Slightly redder and duller	Bright blue Somewhat redder	HUE Daylight Artificial light (tungsten)	
2  — III/2 Acetate, cellulose and nylon — <i>ss</i>	2, 3  Moderate — Acetate and cellulose— <i>u</i>	2  Moderate — Acetate— <i>vss</i> , cellulose— <i>ss</i>	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres	
Silk: acetic acid	Nylon: pale dyeings with acetic or formic acid Silk: acetic acid or neutral	Silk: Glauber's salt + sodium phosphate or in degumming liquor broken with acetic acid	DYEING: OTHER FIBRES	
Wool, silk and viscose: direct	Wool and silk: direct		PRINTING	
AATCC 3-4 3 — — 4  4 5 6  4 4 — —  1-2 1-2 3-4 — —  4 4 4 3-4 3-4	ISO 3-4 4 4 4-5 3  — 5 6-7  2 1 1-2 1  2 1 4 1-2 1  4-5 2 3 2 1	AATCC 3 3 — —  1 1-2 2  1 — — —  1 — 2 — —  4-5 — 5 3 —	ISO 3 5 — —  2 3 3  4 — 4 —  1-2 — 4 2 —  4-5 — 4 3-4 4	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ – $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Poor Slightly greener — Greener and duller	Moderate to good Little change — Somewhat greener and duller	Moderate Slightly duller — Greener and duller	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron	
Paper: coating See Leather Dyes section	Phenol-formaldehyde cast- ing resins See Leather Dyes section		NON-TEXTILE USAGE	
	Very good solubility in water		NOTES	

# C.I. Acid Blue 101—106

C.I. Acid Blue	101	102	103
<b>CHEMICAL CLASS</b>	—	Azine	Triphenylmethane
<b>C.I. CONSTITUTION NUMBER</b>	—	50320	42120
<b>HUE</b> Daylight Artificial light (tungsten)	Blue→Reddish blue Duller	Blue Slightly redder	Greenish blue Greener
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	2  Moderate — Acetate and cellulose— <i>u</i>	1, 2  — II/3 Acetate and cellulose— <i>ss</i>	1, 2  Good — Acetate— <i>u</i> , cellulose— <i>ss</i>
<b>DYEING: OTHER FIBRES</b>	Silk: acetic acid	Silk: neutral or in degumming liquor broken with acetic acid Jute Coir	Nylon: formic acid Silk: degumming liquor broken with acetic, formic or sulphuric acid
<b>PRINTING</b>	Vigoureux printing Coloured discharges	Wool and silk: direct and in colour discharge pastes	Wool and silk: direct
<b>FASTNESS PROPERTIES</b> Method	ISO	AATCC ISO	AATCC ISO
Alkali	5	3-4 4-5	2-3 3
Carbonising	4-5	4 4	4 4
Chlorination — alteration	—	— 4	— —
staining wool	—	— 4	— —
Decatising	4-5	5 4	4-5 4-5
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	3	— 3	— 2
normal	4	3-4 4	3 3
2 × normal	4	— 4	— 3
Milling, alkaline — alteration	3-4	2-3 1	3-4 3-4
staining wool	—	2-3 1	— —
Milling, acid — alteration	—	— 3-4	— —
staining wool	—	— 2	— —
Peroxide bleaching — alteration	—	1 1	2-3 3
staining wool	—	1 1	— —
Perspiration	4	3-4 4	4 4
Potting — alteration	—	— 2	— —
staining wool	—	— 1	— —
Sea water — alteration	4-5	5 4	4-5 4
staining wool	—	5 3-4	— —
Stoving	4	5 4	3-4 4
Washing — alteration	3-4	3 3	3-4 3-4
staining wool	—	3 3	3-4 4
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Poor Little duller Little change Little duller	Poor Somewhat greener and duller Little effect Somewhat greener and duller	Poor Slightly duller — Greener and duller
<b>NON-TEXTILE USAGE</b>		See Leather Dyes section Paper: coating Phenol-formaldehyde resins Soap Wood stains Used as a solvent dye in alcoholic solvents	Inks
<b>NOTES</b>		Solubility in water: fair	Solubility in water: very good



104	105	106	C.I. Acid Blue
Triphenylmethane 42735	— —	— —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Bright blue Little redder and duller	Reddish navy Duller	Greenish blue Greener and duller	HUE Daylight Artificial light (tungsten)
2  Good — Acetate, cellulose and nylon — <sub>ss</sub>	2  Moderate to good — Acetate and cellulose— <i>u</i> , Silk— <i>s</i>	2  — III/2 Acetate and cellulose— <i>u</i>	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Silk: acetic acid		Nylon: acetic acid Silk: acetic acid	DYEING: OTHER FIBRES
Wool and silk: direct			PRINTING
AATCC 3-4 3-4 3 — 5  1 1 2  2-3 — —  3-4 — 4 — —  4-5 — 4 3-4 —	ISO 4 4 — — 4  1 1 2  3-4 — 3 —  2-3 — 4 — —  4 — 4 4 —	ISO 3-4 4-5 — — 4  — 5 —  3 3 3-4 4  3 2 3 — —  3-4 2 1 3 3	FASTNESS PROPERTIES Method Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Good Greener — Greener and duller	Moderate Slight change — Slight change	Poor Greener Little effect Duller and greener	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
Barium salt used as a pigment See Leather Dyes section Nitrocellulose Shoe polishes Wood stains			NON-TEXTILE USAGE
Solubility in water: very good		Solubility in water 25 g/l	NOTES

# C.I. Acid Blue 107—111

C.I. Acid Blue	107	108	109
CHEMICAL CLASS	—	Triphenylmethane	Triphenylmethane
C.I. CONSTITUTION NUMBER	—	44080	42740
HUE Daylight Artificial light (tungsten)	Blue Slightly duller	Blue Slightly redder	Bright blue Little change
DYEING: WOOL Method	2	2	2
Levelling S.D.C. migration test method/grade Staining other fibres	Moderate to good — Acetate and cellulose— <i>u</i> , silk— <i>hs</i>	Moderate — Acetate and cellulose— <i>ss</i>	Moderate — Acetate and cellulose— <i>ss</i>
DYEING: OTHER FIBRES		Silk: broken degumming liquor	Silk: acetic acid or neutral liquor
PRINTING		Wool and silk: direct	Wool and silk: direct
FASTNESS PROPERTIES Method	ISO	ISO	AATCC      ISO
Alkali	2-3	4	1      3
Carbonising	4	4-5	2      3
Chlorination — alteration	—	—	—      —
staining wool	—	—	—      —
Decatising	4	4-5	—      4
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	2	1	—      1
normal	3	2	2-3      2
2 × normal	3	2-3	—      2
Milling, alkaline — alteration	4	3	1      3-4
staining wool	4	—	—      —
Milling, acid — alteration	1	3	—      3-4
staining wool	3	—	—      —
Peroxide bleaching — alteration	1	1	1      1
staining wool	4	—	—      —
Perspiration	2-3	3	3      4
Potting — alteration	—	1-2	2      —
staining wool	—	—	—      —
Sea water — alteration	2-3	2-3	4      4
staining wool	4	—	—      —
Stoving	4	3-4	5      4
Washing — alteration	4	3	3      3-4
staining wool	3-4	3-4	3      3
OTHER PROPERTIES			
Dischargeability	Good	Poor	Moderate
Effect of metals — copper	Much weaker and duller	Greener and duller	Somewhat duller and greener
chromium	—	—	Little change
iron	Weaker and duller	Greener and duller	Little change
NON-TEXTILE USAGE		Salts as pigments for writing and stamp inks and wood stains Paper	Salts as pigments Paper See Leather Dyes section
NOTES		Solubility in water: good	Solubility in water: good

110	111	C.I. Acid Blue
Triphenylmethane 42750	Anthraquinone 62155	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Blue Little change	Bright blue Duller and weaker	HUE Daylight Artificial light (tungsten)
In a boiling alkaline (borax) bath; rinse and acidify to produce the final dyeing — — Acetate, cellulose and silk— <i>hs</i>	1, 2  Moderate to good — Acetate and cellulose— <i>u</i>	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
	Nylon: acetic acid Silk: acetic acid	DYEING: OTHER FIBRES
	Wool, silk, nylon and viscose: direct	PRINTING
ISO  2 4-5 — —  1 2 2  2 — — —  — — 2 — —  2 — 4 2-3 —	ISO  4-5 4-5 — — 5  5 5-6 6  4 4 4-5 —  1 — 4-5 — —  4 — 5 4 4	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
	Poor Slightly duller Little effect Duller and greener	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
Paper Pigments	Anodised aluminium Paper	NON-TEXTILE USAGE
	On nylon fastness properties are similar to those on wool; on silk wet fastness properties are much lower than on wool Solubility in water: good	NOTES

# C.I. Acid Blue 112—117

C.I. Acid Blue	112	113	114
<b>CHEMICAL CLASS</b>	—	Disazo	Disazo
<b>C.I. CONSTITUTION NUMBER</b>	—	26360	26361
<b>HUE</b> Daylight Artificial light (tungsten)	Bright blue Duller and weaker	Reddish navy Little redder	Navy —
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	2  Moderate — Cellulose— <i>u</i>	1, 2. Sodium dichromate is sometimes added to the dye bath — IV/2 —	Properties and usage very closely similar to those of C.I. Acid Blue 113
<b>DYEING: OTHER FIBRES</b>	Nylon: acid Silk: acetic acid	Silk: acetic acid or neutral Nylon: weak acid; polyester/ cotton reserve 5, 3	
<b>PRINTING</b>	Wool, silk, nylon and vis- cose: direct		
<b>FASTNESS PROPERTIES</b> Method	ISO	AATCC	ISO
Alkali	3-4	—	4
Carbonising	4	—	3
Chlorination — alteration	4-5	—	3
staining wool	5	—	5
Decatising	4	—	3
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal	4-5	6-7*	—
normal	5	6-7†	5
2 × normal	5-6	—	5-6
Milling, alkaline — alteration	3-4	—	2
staining wool	3-4	—	1
Milling, acid — alteration	—	—	4
staining wool	—	—	1
Peroxide bleaching — alteration	4-5	—	3
staining wool	4	—	1
Perspiration	5	5	3-4
Potting — alteration	3	—	1
staining wool	2	—	1
Sea water — alteration	5	—	4-5
staining wool	4	—	3
Stoving	4-5	—	1
Washing — alteration	3-4	4-5	3
staining wool	4-5	5	1
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Poor Duller Slight effect Duller	Poor Little change Little change Weaker	
<b>NON-TEXTILE USAGE</b>	Salts as pigments Paper	See Leather Dyes section	
<b>NOTES</b>	<b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—colourless Solubility in water: good	Solubility in water 100 g/l Fastness on silk is similar to that on wool Fastness on nylon (ISO): De- catising 5; Light 5-6, 6-7; Perspiration 5; Sea water 5; Washing 4-5 *1.0% †2.0%	



115	116	117	C.I. Acid Blue
— —	Disazo 26380	Monoazo 17055	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Navy —	Reddish navy Little change	Reddish navy Redder and duller	HUE Daylight Artificial light (tungsten)
	1, 2  Moderate — Acetate and cellulose—ss	1, 2  Moderate — Acetate and cellulose—ss	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Silk	Nylon: formic acid Silk: acetic acid or neutral	Nylon: formic acid Silk: degumming liquor broken with acetic acid	DYEING: OTHER FIBRES
		Wool, silk and nylon: direct	PRINTING
	AATCC                  ISO 4-5                  4-5 3                      4 —                      3 —                      — 3                      2-3  4                      4 5                      5 6                      5-6  3-4                  3-4 3-4                  3-4 —                      2 —                      —  4                      3-4 —                      — 4                      3-4 —                      — —                      —  4-5                  4 —                      — 1                      1 3                      3-4 3                      3	AATCC                  ISO 3-4                  4 4                      4 —                      — —                      — 5                      5  3                      — 4                      5 5                      —  3-4                  3 —                      — —                      3 —                      —  1                      1 —                      — 3-4                  3 —                      — —                      —  2                      3 —                      — 3-4                  3-4 2-3                  3 2-3                  2-3	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
	Poor Slightly greener Little effect Duller and weaker	Moderate Redder and duller Little effect Duller	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
See Leather Dyes section	Biological stain Wood stains See Leather Dyes section	See Leather Dyes section	NON-TEXTILE USAGE
	Solubility in water: good	Solubility in water: good	NOTES

**C.I. Acid Blue 117:1—122**

<b>C.I. Acid Blue</b>	<b>117:1</b>	<b>118</b>	<b>119</b>
<b>CHEMICAL CLASS</b>	—	Disazo	Triphenylmethane
<b>C.I. CONSTITUTION NUMBER</b>	—	26410	42765
<b>HUE</b> Daylight Artificial light (tungsten)		Navy Little greener	Blue —
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	Slightly different chemi- cally from C.I. Acid Blue 117 but very similar in properties and usage	1, 2  — IV/1 —	Neutral or slightly alkaline, developed by acid Moderate — Cellulose—ss
<b>DYEING: OTHER FIBRES</b>		Silk: acetic acid or neutral	Silk: dyed neutral and de- veloped with sulphuric acid
<b>PRINTING</b>			Wool, silk and viscose: direct
<b>FASTNESS PROPERTIES</b> Method		ISO	ISO
Alkali		4	1
Carbonising		3	4
Chlorination — alteration		3	—
staining wool		5	—
Decatising		3	5
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal		—	3
normal		5	3
2 × normal		5-6	3-4
Milling, alkaline — alteration		3	1
staining wool		1	—
Milling, acid — alteration		4	2-3
staining wool		1	—
Peroxide bleaching — alteration		3	—
staining wool		1	—
Perspiration		4	4-5
Potting — alteration		1	3-4
staining wool		1	1
Sea water — alteration		4	5
staining wool		2	—
Stoving		1	4
Washing — alteration		3	2-3
staining wool		2	—
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron		Poor Little change Little change Much greener and duller	Moderate Slightly duller — Slightly duller
<b>NON-TEXTILE USAGE</b>		Biological stain See Leather Dyes section	Bright blue pigment for print- ing inks. Good lithographic properties and fair transpar- ency Indicator
<b>NOTES</b>		Fastness properties on nylon and silk are similar to those on wool Solubility in water: good	Solubility in water poor

120	121	122	C.I. Acid Blue	
Disazo 26400	Azine 50310	— —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER	
Reddish navy Little change	Blue Slightly greener	Bright blue Redder	HUE Daylight Artificial light (tungsten)	
1, 2. Sodium dichromate sometimes added to the dyebath Moderate — Acetate and cellulose— <i>ss</i>	1, 2, 3  Good — Acetate— <i>ss</i> , cellulose— <i>u</i>	2, 3  Good — Acetate and cellulose— <i>u</i> , silk— <i>hs</i>	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres	
Nylon: acetic acid or neutral Silk: acetic acid or Glauber's salt	Silk: acetic or sulphuric acid	Nylon: acetic acid	DYEING: OTHER FIBRES	
			PRINTING	
AATCC 4-5 3 — 3  4 5 6  3 — — —  4 — 3 —  3 — 1 3 3	ISO 4-5 4 3 — 3  3 4 4-5  3-4 — 2 —  3-4 — 3-4 —  3 — 5 3 3	AATCC Wool 3 4 — — —  — 5 —  3-4 — — —  3-4 — 4-5 —  4-5 — — 3-4 —	Nylon — — — 5* —  — 5 —  4-5 — — —  4 — 4-5 —  — — — 5 — — 5 —	FASTNESS PROPERTIES Method Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Poor Little duller Little effect Duller and weaker	Poor Little duller Unaffected Little duller	Moderate (on nylon) Much greener and weaker — Much greener and weaker	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron	
See Leather Dyes section Biological stain Paper: surface colouring			NON-TEXTILE USAGE	
Fastness on nylon (ISO): Light 4-5, 4-5, 5; Perspiration 4; Washing 4 Solubility in water: good	Solubility in water: good	*Sublimation  Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—blue Solubility in water: good	NOTES	

**C.I. Acid Blue 123—127:1**

<b>C.I. Acid Blue</b>	<b>123</b>	<b>124</b>	<b>125</b>
<b>CHEMICAL CLASS</b>	Triarylmethane	Anthraquinone	—
<b>C.I. CONSTITUTION NUMBER</b>	44510	64005	—
<b>HUE</b> Daylight Artificial light (tungsten)	Blue Slightly redder	Bright reddish blue Slightly greener	Greenish blue —
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	1, 2  Good — Acetate— <i>ss</i> , cellulose— <i>u</i>	1, 2, 3  Moderate — Acetate— <i>ss</i> , cellulose— <i>u</i>	2  Moderate — Acetate and cellulose— <i>vss</i>
<b>DYEING: OTHER FIBRES</b>	Silk: broken degumming liquor	Silk: broken degumming liquor or Glauber's salt	Silk: acetic acid or neutral
<b>PRINTING</b>	Wool and silk: direct	Wool and silk: direct	
<b>FASTNESS PROPERTIES</b> Method	ISO	ISO	AATCC      ISO
Alkali	2-3	4	—      5
Carbonising	5	3-4	4      5
Chlorination — alteration	—	—	—      5
staining wool	—	—	—      —
Decatising	5	4	—      5
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	4	4-5	—      3
normal	4-5	5	3-4      4
2 × normal	5	6	—      4
Milling, alkaline — alteration	3-4	2	—      4-5
staining wool	—	—	—      5
Milling, acid — alteration	—	3	—      2-3
staining wool	—	—	—      —
Peroxide bleaching — alteration	1	1-2	—      —
staining wool	—	—	—      —
Perspiration	4	3-4	5      5
Potting — alteration	—	—	—      —
staining wool	—	—	—      —
Sea water — alteration	4-5	3	4      5
staining wool	—	—	—      —
Stoving	5	4	—      5
Washing — alteration	4	2-3	4-5      5
staining wool	3-4	2-3	4-5      5
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Poor Little change Little change Slightly duller	Poor Duller — Duller	Poor Unaffected Unaffected Duller
<b>NON-TEXTILE USAGE</b>	See Leather Dyes section		
<b>NOTES</b>		Solubility in water: moderate—good Washing fastness is improved by aftertreatment with tannic acid and tartar emetic	Solubility in water: good



126	127	127:1	C.I. Acid Blue	
— —	Anthraquinone 61135	Anthraquinone —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER	
Bright reddish blue Redder	Blue Slightly greener		HUE Daylight Artificial light (tungsten)	
2  — III/1 Acetate and cellulose—u	1, 2  — IV/1 Acetate—ss, cellulose—s	Slightly different chemi- cally from C.I. Acid Blue 127 but very similar in properties and usage	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres	
Nylon: acetic acid, poly- ester/cotton reserve 4, 4 Silk: acetic acid or neutral	Nylon: acid or neutral Silk: acetic acid or neutral		DYEING: OTHER FIBRES	
Wool and silk: direct	Wool and silk: direct		PRINTING	
AATCC 5 4-5 4-5 4-5 4-5  4-5 4-5 5  3-4 3-4 — —  — — 4-5 — —  4-5 4-5 4-5 4 4	ISO 5 4-5 4 5 4  4-5 5 5-6  3 1 3-4 4  3-4 1 3-4 1 1  4 3 4-5 2 1	AATCC 4 3-4 4-5 4-5 4-5  4-5 5 5-6  3-4 3-4 — —  2-3 2-3 4 — —  5 5 4 4 4	ISO 5 4 4 3-4 4  4 4-5 4-5 4  4-5 4 5 (pH 8.0) 5 2  5 4-5 4-5 4 (ISO 3) 4-5	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Poor Little change Unaffected Little greener and duller	Poor Slightly duller Little effect Slightly duller and weaker	— 4-5 (duller) 3-4 (greener, duller) 4 (duller)	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron	
	See Leather Dyes section		NON-TEXTILE USAGE	
Solubility 60 g/l Fastness on nylon (ISO): Decatising 5; Light 5-6, 6-7, 7; Perspiration 5; Sea water 5; Washing 4	Solubility in water: good Fastness on nylon (ISO): Light 5, 5-6, 6; Perspira- tion 4; Washing 4  Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—bluish green		NOTES	

**C.I. Acid Blue 128—134**

<b>C.I. Acid Blue</b>	<b>128</b>	<b>129</b>	<b>130</b>
<b>CHEMICAL CLASS</b>	Disazo	Anthraquinone	—
<b>C.I. CONSTITUTION NUMBER</b>	20435	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Dull greenish blue Little change	Bright blue Very slightly redder	Blue Duller
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	2  Moderate — Acetate and cellulose— <i>u</i> , silk— <i>s</i>	2  — III/3-4 Acetate and cellulose— <i>u</i>	2  Moderate to good — Acetate and cellulose— <i>s</i> , silk— <i>hs</i>
<b>DYEING: OTHER FIBRES</b>		Nylon: acetic acid Silk: acetic acid or neutral	
<b>PRINTING</b>	Wool: direct	Wool, silk and nylon: direct	
<b>FASTNESS PROPERTIES</b> Method	ISO	AATCC ISO Wool Nylon	ISO
Alkali	4	4 5	4
Carbonising	5	4-5 4	4-5
Chlorination — alteration	—	3-4 3	—
staining wool	—	3-4 5	—
Decatising	5	4-5 4	5
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	4	4 5	5
normal	4-5	4-5 5-6	5-6
2 × normal	5	5 6	6
Milling, alkaline — alteration	3	3-4 1	4
staining wool	3	3-4 1	3
Milling, acid — alteration	4-5	— 3	3
staining wool	4-5	— 1	2-3
Peroxide bleaching — alteration	3-4	— 2	4
staining wool	2-3	— 1	2
Perspiration	3	4 3-4	4
Potting — alteration	—	— 1	—
staining wool	—	— 1	—
Sea water — alteration	3-4	4 4	4-5
staining wool	3-4	4 1	4-5
Stoving	4	4-5 4	5
Washing — alteration	3-4	4 2	4
staining wool	2-3	4 1	3
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Good Duller — Duller	Poor Slight change Little change Slightly greener	Poor Duller — Weaker and duller
<b>NON-TEXTILE USAGE</b>		See Leather Dyes section	
<b>NOTES</b>	Solubility in water: good	<b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—blue Solubility in water: moderate	

131	132	133 and 134	C.I. Acid Blue
— —	— —	— —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Bright reddish blue Much redder	Reddish navy —		HUE Daylight Artificial light (tungsten)
1  Moderate — Acetate— <i>u</i> , cotton— <i>ss</i> , viscose — <i>u</i>			DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: ammonium sulphate Silk: ammonium sulphate or broken degumming liquor			DYEING: OTHER FIBRES
Vigoureux printing			PRINTING
ISO  5 4-5 4 — 5  5-6 6 6-7  4 5 4-5 5  4-5 4 5 4 2-3  5 5 5 4 5			FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Poor Somewhat duller and greener Little effect Duller and greener			OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
	Leather: vegetable, chrome and semi-chrome tannages Bookbinding, shoe-upper, suède and upholstery leath- ers. Brush staining. On chrome tannage (ISO): Light 3, Penetration 3	See Leather Dyes section	NON-TEXTILE USAGE
Solubility in water: moderate			NOTES

**C.I. Acid Blue 135—140**

<b>C.I. Acid Blue</b>	<b>135</b>	<b>136</b>	<b>137</b>
<b>CHEMICAL CLASS</b>	Monoazo	—	Anthraquinone
<b>C.I. CONSTITUTION NUMBER</b>	13385	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Reddish navy Little change	Blue Little change	Blue Slightly redder and duller
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	2  Moderate — Acetate and cellulose— <i>u</i>	2  Moderate — Acetate and cellulose— <i>u</i> , silk— <i>s</i>	2, 3  Good — Acetate and cellulose— <i>u</i> , silk— <i>s</i>
<b>DYEING: OTHER FIBRES</b>	Silk: broken degumming liquor		Nylon: acetic or formic acid
<b>PRINTING</b>			Wool and silk direct
<b>FASTNESS PROPERTIES</b> Method	ISO	ISO	AATCC
Alkali	3-4	5	3
Carbonising	4-5	4-5	5
Chlorination — alteration	—	2-3	—
staining wool	—	—	—
Decatising	4	3-4	—
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal	—	4	5
normal	4-5	4-5	5-6
2 × normal	—	4-5	6
Milling, alkaline — alteration	2	3-4	1
staining wool	—	3-4	—
Milling, acid — alteration	2	—	—
staining wool	—	—	—
Peroxide bleaching — alteration	2	—	1
staining wool	—	—	—
Perspiration	2	3-4	2
Potting — alteration	—	—	—
staining wool	—	—	—
Sea water — alteration	3	5	4
staining wool	—	—	—
Stoving	1	2-3	5
Washing — alteration	3-4	4	2-3
staining wool	2-3	5	—
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Moderate Somewhat weaker — Much weaker	Poor — — —	Poor to moderate Slightly duller — Much greener and duller
<b>NON-TEXTILE USAGE</b>		Loose fur or fur hoods Fastness to acid planking is outstanding and white fur is unstained	Urea, melamine and nitro- cellulose plastics
<b>NOTES</b>	Solubility in water: good	Poor solubility in water	<b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—dark greenish blue Solubility in water: very good



138	139	140	C.I. Acid Blue
Anthraquinone 62075	— —	— —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Blue Little duller and redder	Dull blue Duller and redder	Bright blue Redder	HUE Daylight Artificial light (tungsten)
2  Poor — Acetate and cellulose—ss	2  Poor — Acetate and cellulose—ss, silk—hs	1  Poor — —	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: weakly acid Silk: acetic acid or neutral	Nylon: weakly acid Silk: acetic acid or neutral	Nylon: weakly acid Silk: neutral	DYEING: OTHER FIBRES
Wool, silk, nylon and vis- cose: direct	Wool, silk, nylon and vis- cose: direct	Wool, silk and viscose: direct	PRINTING
ISO  — 5 4 (greener, duller) — 4-5 (severe)  5 5-6 5-6  4-5 4-5 4-5 4-5  4-5 4-5 5 (pH 8·0) 4-5 2  5 5 4-5 4 (ISO 3) 4-5	ISO  — 5 5 5 5 —  4-5 5 5-6  5 5 — —  4-5 4 5 3-4 1-2  5 5 5 4 5	ISO  5 5 3-4 (duller) — 5 (severe)  5-6 6 6  3-4 4-5 5 4  5 3-4 5 (pH 8·0) 4-5 1-2  5 5 5 5 (ISO 3) 5	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ – $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining woo Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Poor 4 (weaker, greener) 3-4 (greener, duller) 4-5	Poor Slightly duller Little effect Slightly duller	Poor 4 (duller) 3 (duller) 4-5	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
			NON-TEXTILE USAGE
Fastness on nylon (ISO): Light 4-5, 5, 5-6; Perspira- tion 4-5; Washing 4-5  Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—greenish blue Solubility in water: good	Fastness properties on nylon are similar to those on wool  Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—violet Solubility in water: good	Fastness on nylon (ISO): Light 5, 5-6, 6; Perspira- tion 4-5; Washing 3-4  Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—blue Solubility in water: mod- erate	NOTES

# C.I. Acid Blue 141—146

C.I. Acid Blue	141	142	143
CHEMICAL CLASS	—	—	Anthraquinone
C.I. CONSTITUTION NUMBER	—	—	—
HUE Daylight Artificial light (tungsten)	Blue Duller and redder	Greenish blue Greener and brighter	Blue Greener and duller
DYEING: WOOL Method	2	1, 2	2
Levelling S.D.C. migration test method/grade Staining other fibres	Moderate to good — Acetate—s, cellulose—u, silk—s	Moderate — Acetate and cellulose—ss	Moderate — Acetate and cellulose—u
DYEING: OTHER FIBRES		Silk: acetic acid or neutral	Nylon: acetic acid Silk: acetic acid or neutral
PRINTING	Wool, silk and viscose: direct	Wool and silk: direct	
FASTNESS PROPERTIES Method	ISO	ISO	ISO
Alkali	4	4	4-5
Carbonising	5	4	4-5
Chlorination — alteration	—	3-4	3-4
staining wool	—	—	—
Decatising	5	4	4-5
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	4-5	2	5-6
normal	5	2	6
2 × normal	5-6	3	6-7
Milling, alkaline — alteration	2-3	3-4	3-4
staining wool	2	4-5	5
Milling, acid — alteration	3	4	5
staining wool	3	2	4-5
Peroxide bleaching — alteration	3-4	1-2	3-4
staining wool	2	—	—
Perspiration	3-4	5	5
Potting — alteration	—	—	—
staining wool	—	—	—
Sea water — alteration	3-4	4-5	4-5
staining wool	2-3	—	—
Stoving	4-5	4	4-5
Washing — alteration	3	4	4-5
staining wool	3	4-5	5
OTHER PROPERTIES			
Dischargeability	Poor	Moderate to good	Poor
Effect of metals — copper	Duller	Somewhat greener and duller	Somewhat duller
chromium	Little change	Little change	Little change
iron	Duller	Somewhat greener and duller	Duller and greener
NON-TEXTILE USAGE		See Leather Dyes section	
NOTES		Solubility in water: good	Sensitive to hard water, solubility 20 g/l Fastness on nylon (ISO): Decatising 5; Light 5-6, 6-7, 7; Perspiration 5; Sea water 5; Washing 4-5



# C.I. Acid Blue 147—152

C.I. Acid Blue	147	148	149	
CHEMICAL CLASS	Triphenylmethane	—	—	
C.I. CONSTITUTION NUMBER	42135	—	—	
HUE Daylight Artificial light (tungsten)	Bright blue Greener	Greenish blue Slightly greener	Reddish blue —	
DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres	3  — I/4 Acetate and cellulose— <i>u</i>	1  Poor — Acetate and cellulose— <i>ss</i>		
DYEING: OTHER FIBRES	Silk: broken soap bath	Silk: neutral	Silk	
PRINTING	Wool and silk: direct	Wool and silk: direct		
FASTNESS PROPERTIES Method	AATCC	ISO	AATCC	ISO
Alkali	3	3	5	5
Carbonising	4	3	5	5
Chlorination — alteration	—	3-4	5	3-4
staining wool	—	3-4	—	—
Decatising	4	3-4	5	5
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	2	2	1	1
normal	2	2	2	2
2 × normal	3	3	2	2
Milling, alkaline — alteration	2	1	4	4
staining wool	2	3	4	4
Milling, acid — alteration	—	2	—	—
staining wool	—	1	—	—
Peroxide bleaching — alteration	—	1	—	—
staining wool	—	1	—	—
Perspiration	2-3	2-3	5	5
Potting — alteration	—	1	—	—
staining wool	—	1	—	—
Sea water — alteration	2	2-3	5	5
staining wool	2	1	—	—
Stoving	5	4	5	5
Washing — alteration	4-5	2	4-5	5
staining wool	4-5	3-4	4-5	5
OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron	Moderate to good Duller — Duller	Poor		
NON-TEXTILE USAGE	Soap Printing inks Paper: staining			Leather: vegetable, chrome and semi-chrome tannages. Bookbinding, gloving, shoe-upper, suède and upholstery leathers. Brush staining On chrome tannage (ISO): Light 1, Penetration 1
NOTES	Solubility in water: good	Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—olive green Solubility in water: poor		



150	151	152	C.I. Acid Blue
Anthraquinone 61130	Azo (metallised) —	Azo (metallised) —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Dull greenish blue Duller and redder	Dull blue Somewhat greener	Dull blue Redder	HUE Daylight Artificial light (tungsten)
1, 2 Moderate — Acetate and cellulose— <i>ss</i>	1, 2 Good — —	3 Good — Acetate and cellulose— <i>ss</i> nylon and silk— <i>hs</i>	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Silk: acetic acid or neutral	Nylon: ammonium acetate Silk: acetic acid or neutral		DYEING: OTHER FIBRES
	Wool, silk and nylon: direct Vigoureux printing		PRINTING
AATCC      ISO	ISO	ISO	FASTNESS PROPERTIES Method
5 4-5 3-4 — 4-5	5 4 4-5 4-5 5	5 4-5 — — 4-5	Alkali Carbonising Chlorination — alteration staining wool Decatising
4 5-6 5	6 6-7 7	5 6-7 7	Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal
4 4 — —	4 4-5 4-5 —	4 4-5 — —	Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool
— — 4-5 — —	— — 5 — —	— — 4-5 — —	Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool
5 — 5 4-5 4-5	5 — 5 4-5 4-5	4-5 3-4 3 4 4-5	Sea water — alteration staining wool Stoving Washing — alteration staining wool
Poor Little duller Little change Duller	Good — — —	Moderate — — —	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
			NON-TEXTILE USAGE
Solubility in water: fairly good	Solubility in water: good		NOTES

**C.I. Acid Blue 153—158**

<b>C.I. Acid Blue</b>	<b>153</b>	<b>154</b>	<b>155</b>
<b>CHEMICAL CLASS</b>	Azo (metallised)	Monoazo (metallised)	Monoazo
<b>C.I. CONSTITUTION NUMBER</b>	—	—	14641
<b>HUE</b> Daylight Artificial light (tungsten)	Dull blue Greener, duller	Blue Redder	Dull blue —
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	3  Good — Acetate and cellulose— <i>ss</i> , nylon and silk— <i>s</i>	3  Good; can be salted at boil — Acetate and cellulose— <i>u</i> , silk— <i>s</i>	3  Good — Acetate and cellulose— <i>u</i>
<b>DYEING: OTHER FIBRES</b>		Nylon: acetic or formic acid	Silk: acetic acid or neutral
<b>PRINTING</b>		Wool and silk: direct; presence of chromium acetate improves fixation	Wool and silk: direct
<b>FASTNESS PROPERTIES</b> Method	ISO	AATCC	ISO
Alkali	4-5	3	3-4
Carbonising	4-5	3	5
Chlorination — alteration	—	—	4
staining wool	—	—	—
Decatising	4	5	5
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal	4-5	—	5
normal	6	5	5-6
2 × normal	6-7	—	6
Milling, alkaline — alteration	3-4	2	4
staining wool	4-5	2	4-5
Milling, acid — alteration	—	—	4
staining wool	—	—	3
Peroxide bleaching — alteration	—	1	1
staining wool	—	1	5
Perspiration	4-5	4-5	4-5
Potting — alteration	—	—	3
staining wool	—	—	2
Sea water — alteration	4-5	4-5	4-5
staining wool	3-4	—	—
Stoving	3	4	5
Washing — alteration	4	3-4	4
staining wool	5	3-4	5
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Poor — — —	Moderate Slightly duller and redder — Duller	Good Duller — Little duller
<b>NON-TEXTILE USAGE</b>		See Leather Dyes section	
<b>NOTES</b>		Very good solubility in water  <b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—greenish blue	Good solubility in water

156	157	158	C.I. Acid Blue
Monoazo (metallised) —	Azo (metallised) *	Monoazo (metallised) 14880	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Dull reddish blue Duller and redder	Reddish navy Somewhat redder	Greenish blue Greener	HUE Daylight Artificial light (tungsten)
3  Good; can be salted at boil — Acetate and cellulose— <i>u</i>	3  Good — Acetate— <i>u</i> , cellulose and silk— <i>ss</i>	3  Good; can be salted at boil — Acetate— <i>u</i> , cellulose— <i>ss</i>	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Silk (unweighted): acid bath		Nylon: formic acid Silk: acetic or formic acid	DYEING: OTHER FIBRES
Wool and silk: direct; better fixation if chromium acetate is present	Wool: direct	Wool: direct and dis- charge styles	PRINTING
AATCC      ISO	ISO	AATCC      ISO	FASTNESS PROPERTIES Method
—      4	5	3      2-3	Alkali
5      5	5	3      4	Carbonising
—      4	4	—      3	Chlorination — alteration staining wool
5      5	5	5      4-5	Decatising
5      5	6	—      5	Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal
5-6      6	7	5      5-6	normal
6      6-7	7	—      6	2 × normal
5      3	2-3	3      3-4	Milling, alkaline — alteration staining wool
5      4-5	3	—      —	Milling, acid — alteration staining wool
—      4	4	—      3-4	
—      3	3	—      —	Peroxide bleaching — alteration staining wool
—      1	—	1      1-2	Perspiration
—      5	—	—      —	Potting — alteration staining wool
5      4-5	4-5	3      4	
—      4	—	—      2-3	
—      2	—	—      —	Sea water — alteration staining wool
5      4-5	5	4-5      3-4	Stoving
5      4	3	—      —	Washing — alteration staining wool
4      5	5	4      4-5	
5      4	4-5	2      3	
5      5	5	2      4	
Good Little change — Duller	Poor Duller — Duller	Very good Slightly greener — Duller and weaker	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
See Leather Dyes section		See Leather Dyes section	NON-TEXTILE USAGE
Very good solubility in water  Fastness on silk (ISO): Light 4; Perspiration 2-3; Sea water 2-3; Washing 2-3	Very good solubility in water  <i>*This dye is a mixture but con- tains one main component that is not sold as a homo- geneous dye</i>	Solubility in water: good	NOTES

**C.I. Acid Blue 158:1—162**

<b>C.I. Acid Blue</b>	<b>158:1</b>	<b>158:2</b>	<b>159</b>
<b>CHEMICAL CLASS</b>	Monoazo (metallised)	—	Monoazo
<b>C.I. CONSTITUTION NUMBER</b>	15050	—	—
<b>HUE</b> Daylight Artificial light (tungsten)			Dull blue Redder
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	Very closely similar in properties and usage to C.I. Acid Blue 158	The dyes under this C.I. Generic Name have constitution C.I. 14880 or C.I. 15050; their properties and usage are very closely similar to those of C.I. Acid Blue 158	3  Good — Acetate and cellulose—u
<b>DYEING: OTHER FIBRES</b>			Nylon: formic acid Silk: acetic acid
<b>PRINTING</b>			
<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool			AATCC  — 3 — — —  — 6 —  3-4 — — —  —  3-4 — — —  3-4 — 3 3-4 —
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron			Good Slightly greener — Slightly redder
<b>NON-TEXTILE USAGE</b>			Leather: on chrome tannage
<b>NOTES</b>			Very good solubility in water  <b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—reddish violet



160	161	162	C.I. Acid Blue
Azo (metallised) —	Monoazo (metallised) <b>15706</b>	— —	<b>CHEMICAL CLASS</b> <b>C.I. CONSTITUTION NUMBER</b>
Blue Slightly greener	Dull blue Redder	Greenish navy —	<b>HUE</b> Daylight Artificial light (tungsten)
3  Good; can be salted at boil — Acetate and cellulose— <i>u</i> , silk— <i>hs</i>	3  Good — Acetate— <i>hs</i> , cellulose— <i>ss</i>		<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: acid	Silk: broken degumming liquor	Silk	<b>DYEING: OTHER FIBRES</b>
Wool and silk: direct	Wool and silk: direct		<b>PRINTING</b>
ISO  4 5 3-4 — 5  5 5-6 6  4 — 5 —  1 — 4 4-5 —  5 — 5 4 5	ISO  4 4 4 — 4-5  5 5-6 6  3-4 — 3 —  1-2 — 3-4 2-3 —  3-4 — 4 3-4 —		<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{8}$ – $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Moderate Little duller — Duller	Good Somewhat duller — Much weaker		<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron
	See Leather Dyes section	See Leather Dyes section	<b>NON-TEXTILE USAGE</b>
	Solubility in water: good		<b>NOTES</b>

**C.I. Acid Blue 163—167**

<b>C.I. Acid Blue</b>	<b>163</b>	<b>164</b>	<b>165</b>
<b>CHEMICAL CLASS</b>	Azo (metallised)	Azo (metallised)	Monoazo (metallised)
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Blue —	Blue —	Reddish navy Redder and duller
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	3  Good — Acetate and cellulose—ss	3  Moderate to good — Acetate and cellulose—u, silk—hs	1, 2  Moderate — Acetate and cellulose—ss, silk—hs
<b>DYEING: OTHER FIBRES</b>	Silk: broken degumming liquor		Nylon: ammonium acetate
<b>PRINTING</b>			Wool and nylon: direct
<b>FASTNESS PROPERTIES</b> Method	ISO	ISO	AATCC Wool Nylon
Alkali	4	4	—
Carbonising	4	4-5	—
Chlorination — alteration	—	4	—
staining wool	—	—	—
Decatising	4	4	—
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal	5	5	—
normal	5	5-6	3-4
2 × normal	5-6	6	—
Milling, alkaline — alteration	3-4	4	2-3
staining wool	—	—	—
Milling, acid — alteration	—	4	—
staining wool	—	—	—
Peroxide bleaching — alteration	1	4	—
staining wool	—	—	4-5
Perspiration	4	4-5	5
Potting — alteration	—	2	—
staining wool	—	—	—
Sea water — alteration	3-4	4	4-5
staining wool	—	—	—
Stoving	—	4	—
Washing — alteration	4	4-5	3
staining wool	—	5	—
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Good — Little effect —	— Little duller Little change Duller	Moderate (on nylon) Slightly duller — Much duller
<b>NON-TEXTILE USAGE</b>			
<b>NOTES</b>			*Sublimation Poor solubility in water  <b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—dark reddish blue

166	167	C.I. Acid Blue
— —	— —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Dull reddish blue Much greener and duller	Dull violet Redder and duller	HUE Daylight Artificial light (tungsten)
1, 2  Initial strike level, migration poor — Acetate—s, cotton—ss, viscose—u	1, 2  Initial strike level, migration poor — Cellulose and acetate—ss	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: neutral or slightly alkaline Silk: neutral or weakly acid	Nylon: neutral or slightly alkaline Silk: neutral or weakly acid; levelling good	DYEING: OTHER FIBRES
Wool, silk, nylon and viscose: direct Vigoureux printing	Wool, silk, nylon and viscose: direct Vigoureux printing	PRINTING
ISO  4 4 4 — 4-5  5-6 6 6-7  4 5 — 3  — — 5 3 —  5 5 3-4 4 5	ISO  4 4 3-4 — 4-5  6 6-7 7  5 5 4 3  — — 5 3-4 3  5 5 4 4-5 5	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool  Decatising  Light, $\frac{1}{3}$ - $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool  Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Moderate Unaffected — Unaffected	Good No effect Little duller No effect	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
		NON-TEXTILE USAGE
	Fastness on silk is similar to that on wool Prints have good fastness to light and washing	NOTES

**C.I. Acid Blue 168—171:1**

C.I. Acid Blue	168	168:1	169
CHEMICAL CLASS	—	—	Monoazo
C.I. CONSTITUTION NUMBER	—	—	15025
HUE Daylight Artificial light (tungsten)	Reddish navy Redder		Blue Somewhat duller
DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres	1, 2  Initial strike level, migration poor — Acetate— <i>ss-hs</i> , polyester— <i>u</i> , cellulose— <i>u-s</i>	Slightly different chemically from C.I. Acid Blue 168 but similar in application and properties	3  Good — Acetate, cellulose and silk — <i>ss</i>
DYEING: OTHER FIBRES	Nylon: neutral Silk: neutral or weakly acid; levelling good		
PRINTING	Wool, silk and nylon: direct Vigoureux printing		Wool: direct
FASTNESS PROPERTIES Method	ISO	AATCC	ISO
Alkali	5	—	3
Carbonising	4-5	5	4
Chlorination — alteration	4	2-3	5
staining wool	—	—	—
Decatising	5	—	4-5
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal	6	4-5	—
normal	6-7	—	6-7
2 × normal	7	—	—
Milling, alkaline — alteration	4	—	3-4
staining wool	5	—	—
Milling, acid — alteration	4-5	—	3
staining wool	4	—	—
Peroxide bleaching — alteration	3-4	—	2-3
staining wool	5	—	—
Perspiration	5	5	3-4
Potting — alteration	4	—	2
staining wool	2-3	—	—
Sea water — alteration	5	—	3
staining wool	5	—	—
Stoving	5	5	4
Washing — alteration	5	5	4
staining wool	4-5	5	3-4
OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron	Moderate Little duller Little effect Little duller		Poor Little change Little change Little change
NON-TEXTILE USAGE	See Leather Dyes section		See Leather Dyes section
NOTES	Fastness on silk is similar to that on wool Prints have good fastness to light and washing <b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—olive green; on diln—blue		



<b>170</b>	<b>171</b>	<b>171:1</b>	<b>C.I. Acid Blue</b>
— —	— —	— —	<b>CHEMICAL CLASS</b> <b>C.I. CONSTITUTION NUMBER</b>
Reddish blue Slightly redder	Dull greenish blue Greener		<b>HUE</b> Daylight Artificial light (tungsten)
1, 2  Initial strike level, migration poor — Acetate—s, cellulose—ss	1, 2  Initial strike level, migration poor — Acetate—s, cellulose—ss	Slightly different chemically from C.I. Acid Blue 171 but similar in application and properties	<b>DYEING: WOOL</b> Method  Levelling. S.D.C. migration test method/grade Staining other fibres
Nylon: neutral Silk: neutral or acetic acid	Nylon: neutral Silk: neutral or acetic acid		<b>DYEING: OTHER FIBRES</b>
Wool, silk, nylon and viscose: direct Vigoureux printing	Wool, silk, nylon and viscose: direct Vigoureux printing		<b>PRINTING</b>
ISO  5 4-5 4 4-5 5  6 6-7 7  4-5 4-5 5 5  4 4 5 4 3  5 5 5 5 5	ISO  5 4-5 3-4 5 4  5-6 6-7 7  4 5 4-5 5  3 4-5 5 3 2  5 5 5 4 5		<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ - $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Moderate Unaffected Unaffected Unaffected	Poor No change No change Slightly duller		<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron
See Leather Dyes section	See Leather Dyes section		<b>NON-TEXTILE USAGE</b>
Fastness on nylon and silk similar to that on wool Prints have good fastness to light and washing	Fastness on nylon and silk similar to that on wool Prints have good fastness to light and washing		<b>NOTES</b>

# C.I. Acid Blue 172—177

C.I. Acid Blue	172 & 173	174	175
<b>CHEMICAL CLASS</b>	—	Monoazo	Anthraquinone
<b>C.I. CONSTITUTION NUMBER</b>	—	18058	—
<b>HUE</b> Daylight Artificial light (tungsten)	— —	Blue Little redder	Bright greenish blue Greener and duller
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres		2  Moderate — Acetate and cotton— <i>hs</i> , silk — <i>d</i>	1, 2  Very good — Acetate and cellulose— <i>u</i>
<b>DYEING: OTHER FIBRES</b>		Nylon: ammonium acetate; exhaust with acetic or formic acid	Nylon: pale dyeings as for wool, heavy dyeings with formic acid Silk: neutral
<b>PRINTING</b>			Wool, silk and nylon: direct
<b>FASTNESS PROPERTIES</b> Method		ISO	Wool      ISO      Nylon      Silk
Alkali		2-3	4-5      —      —
Carbonising		4	4-5      —      —
Chlorination — alteration		—	4†      —      —
staining wool		—	5      —      —
Decatising		4	5      4-5*      5*
Light, $\frac{1}{8}$ — $\frac{1}{2}$ normal		2	5-6      6      5
normal		3	6-7      6      5-6
2× normal		4	6-7      6-7      6
Milling, alkaline — alteration		2-3	4      —      —
staining wool		4-5	4      —      —
Milling, acid — alteration		3	4-5      —      —
staining wool		4	3-4      —      —
Peroxide bleaching — alteration		2	4†      —      —
staining wool		3	3      —      —
Perspiration		3	5      5      4-5
Potting — alteration		—	4-5      —      —
staining wool		—	1      —      —
Sea water — alteration		3	5      —      —
staining wool		3-4	5      —      —
Stoving		3	5      —      —
Washing — alteration		2	4-5      4      3
staining wool		4-5	4-5      —      —
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron		— 3 — 2-3	Not dischargeable 3-4 (duller) Greener and duller 4 (duller)
<b>NON-TEXTILE USAGE</b>	C.I. Acid Blue 172: see Leather Dyes section C.I. Acid Blue 173: Leather: vegetable, chrome and semi-chrome tannages Gloving, shoe-upper and suède leathers. On chrome tannage (ISO): Light 3, Penetration 1-2	See Leather Dyes section	Rabbit fur for 'mélange' hats
<b>NOTES</b>		Very good solubility Fastness on nylon (ISO): Light 3; Perspiration 4; Washing 3-4	Very good solubility *Hot pressing †Greener, duller ‡Weaker, brighter



**C.I. Acid Blue 178—183**

<b>C.I. Acid Blue</b>	<b>178</b>	<b>179</b>	<b>180</b>
<b>CHEMICAL CLASS</b>		Monoazo (1:2 metal complex)	
<b>C.I. CONSTITUTION NUMBER</b>		—	
<b>HUE</b> Daylight Artificial light (tungsten)		Dull blue —	
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	This C.I. Generic Name is discontinued; the dyes formerly listed under it now appear under C.I. Acid Black 140	1, 2  Moderate — Acetate and viscose— <i>ss</i> , cotton— <i>hs</i>	This C.I. Generic Name is discontinued; the dyes formerly listed under it now appear under C.I. Acid Blue 62
<b>DYEING: OTHER FIBRES</b>		Nylon and silk: neutral or slightly acid	
<b>PRINTING</b>		Wool, silk and nylon: direct	
<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool		AATCC  5 3–4 — — 4  3–4 4–5 6  4 3–4 — —  — — 4–5 — —  5 4–5 — 4–5 4	
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron		Good — — —	
<b>NON-TEXTILE USAGE</b>			
<b>NOTES</b>		Very good solubility <b>Reaction on wool</b> H <sub>2</sub> SO <sub>4</sub> conc.—greyish violet; on diln—violet	



181	182	183	C.I. Acid Blue
— —	— —	Monoazo —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Bright blue Somewhat greener	Bright blue —	Bright blue —	HUE Daylight Artificial light (tungsten)
1, 2  Good — Acetate, acrylic, cotton and polyester— <i>u</i>	3  Good — Acetate and cellulose— <i>u</i>	1, 2  Good; can be salted at boil — Acetate and cellulose— <i>ss</i>	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon and silk: neutral or weakly acid	Acrylic: formic or sulphuric acid	Silk: neutral or weakly acid	DYEING: OTHER FIBRES
Wool, silk and nylon: direct			PRINTING
Wool 4-5 4-5 4-5 — 5  5-6 6 6-7  4-5 5 5 5  3-4 3 5 4-5 2-3  5 5 — 4-5 5	ISO Silk — — — — — 6 —<		

### C.I. Acid Blue

1364

187	188	189	C.I. Acid Blue																																																																																																																																																														
Monoazo (1 : 2 metal complex) —	Monoazo (1 : 2 metal complex) —		CHEMICAL CLASS  C.I. CONSTITUTION NUMBER																																																																																																																																																														
Navy Somewhat duller	Reddish navy Redder and duller		HUE Daylight Artificial light (tungsten)																																																																																																																																																														
1  Good; can be salted at boil — Acetate and cotton— <i>ss</i>	1, 2  Good; can be salted at boil — Acetate and cotton— <i>hs</i>	This C.I. Generic Name is discontinued	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres																																																																																																																																																														
Acrilan: acetic acid, exhaust with sulphuric acid Nylon and silk: neutral or weakly acid	Acrilan: acetic acid, exhaust with sulphuric acid Silk: neutral or acetic acid		DYEING: OTHER FIBRES																																																																																																																																																														
Wool, silk and nylon: direct	Wool, silk and nylon: direct		PRINTING																																																																																																																																																														
<div>ISO</div> <table><tr><td>Wool</td><td>Silk</td><td>Nylon</td><td>Acrilan</td></tr><tr><td>4</td><td>—</td><td>—</td><td>—</td></tr><tr><td>5</td><td>—</td><td>—</td><td>—</td></tr><tr><td>3</td><td>—</td><td>—</td><td>—</td></tr><tr><td>—</td><td>—</td><td>—</td><td>—</td></tr><tr><td>5</td><td>—</td><td>—</td><td>—</td></tr><tr><td>—</td><td>—</td><td>—</td><td>—</td></tr><tr><td>6-7</td><td>5-6</td><td>6-7</td><td>6-7</td></tr><tr><td>7</td><td>—</td><td>—</td><td>—</td></tr><tr><td>4-5</td><td>—</td><td>4-5</td><td>4-5</td></tr><tr><td>5</td><td>—</td><td>5</td><td>4-5</td></tr><tr><td>4</td><td>—</td><td>—</td><td>—</td></tr><tr><td>3</td><td>—</td><td>—</td><td>—</td></tr><tr><td>5</td><td>—</td><td>—</td><td>—</td></tr><tr><td>4-5</td><td>—</td><td>—</td><td>—</td></tr><tr><td>5</td><td>5</td><td>5</td><td>5</td></tr><tr><td>4</td><td>—</td><td>—</td><td>—</td></tr><tr><td>2-3</td><td>—</td><td>—</td><td>—</td></tr><tr><td>5</td><td>5</td><td>—</td><td>—</td></tr><tr><td>5</td><td>—</td><td>—</td><td>—</td></tr><tr><td>4-5</td><td>—</td><td>—</td><td>—</td></tr><tr><td>5</td><td>5</td><td>5</td><td>5</td></tr><tr><td>5</td><td>—</td><td>—</td><td>4-5</td></tr></table>	Wool	Silk	Nylon	Acrilan	4	—	—	—	5	—	—	—	3	—	—	—	—	—	—	—	5	—	—	—	—	—	—	—	6-7	5-6	6-7	6-7	7	—	—	—	4-5	—	4-5	4-5	5	—	5	4-5	4	—	—	—	3	—	—	—	5	—	—	—	4-5	—	—	—	5	5	5	5	4	—	—	—	2-3	—	—	—	5	5	—	—	5	—	—	—	4-5	—	—	—	5	5	5	5	5	—	—	4-5	<div>ISO</div> <table><tr><td>Wool</td><td>Silk</td><td>Acrilan</td></tr><tr><td>4</td><td>—</td><td>—</td></tr><tr><td>5</td><td>—</td><td>—</td></tr><tr><td>2-3</td><td>—</td><td>—</td></tr><tr><td>—</td><td>—</td><td>—</td></tr><tr><td>5</td><td>—</td><td>—</td></tr><tr><td>—</td><td>—</td><td>—</td></tr><tr><td>7</td><td>6-7</td><td>7</td></tr><tr><td>7-8</td><td>—</td><td>—</td></tr><tr><td>5</td><td>—</td><td>5</td></tr><tr><td>5</td><td>—</td><td>4</td></tr><tr><td>4</td><td>—</td><td>—</td></tr><tr><td>3</td><td>—</td><td>—</td></tr><tr><td>4-5</td><td>—</td><td>—</td></tr><tr><td>4</td><td>—</td><td>—</td></tr><tr><td>4</td><td>4</td><td>5</td></tr><tr><td>2-3</td><td>—</td><td>—</td></tr><tr><td>5</td><td>5</td><td>—</td></tr><tr><td>5</td><td>—</td><td>—</td></tr><tr><td>4-5</td><td>—</td><td>—</td></tr><tr><td>4-5</td><td>4-5</td><td>4</td></tr><tr><td>5</td><td>—</td><td>5</td></tr></table>	Wool	Silk	Acrilan	4	—	—	5	—	—	2-3	—	—	—	—	—	5	—	—	—	—	—	7	6-7	7	7-8	—	—	5	—	5	5	—	4	4	—	—	3	—	—	4-5	—	—	4	—	—	4	4	5	2-3	—	—	5	5	—	5	—	—	4-5	—	—	4-5	4-5	4	5	—	5		FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool  Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Wool	Silk	Nylon	Acrilan																																																																																																																																																														
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2-3 Unaffected Unaffected Unaffected	2-3 5 Slightly duller 5		OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron																																																																																																																																																														
Woaled sheepskins See Leather Dyes section	See Leather Dyes section		NON-TEXTILE USAGE																																																																																																																																																														
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**C.I. Acid Blue 190—195**

<b>C.I. Acid Blue</b>	<b>190</b>	<b>191</b>	<b>192</b>
<b>CHEMICAL CLASS</b>		Azo (metal complex)	Azo (metal complex)
<b>C.I. CONSTITUTION NUMBER</b>		—	—
<b>HUE</b> Daylight Artificial light (tungsten)		Blue —	Blue —
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	This C.I. Generic Name is discontinued; the dyes formerly listed under it now appear under C.I. Acid Blue 62	1, 2	1, 2
<b>DYEING: OTHER FIBRES</b>			
<b>PRINTING</b>			
<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool			
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron			
<b>NON-TEXTILE USAGE</b>			
<b>NOTES</b>			



<b>193</b>	<b>194</b>	<b>195</b>	<b>C.I. Acid Blue</b>
Monoazo (1:2 metal complex) <b>15707</b>	Monoazo (1:2 metal complex) <b>17941</b>		<b>CHEMICAL CLASS</b> <b>C.I. CONSTITUTION NUMBER</b>
Reddish navy —	Navy —		<b>HUE</b> Daylight Artificial light (tungsten)
<b>1, 2</b> Poor; initial strike level — Acetate— <i>vss</i> , cellulose— <i>ss</i>	<b>1, 2</b> Poor; initial strike level — Acetate— <i>vss</i> , cellulose— <i>ss</i>		<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: neutral Silk: as for wool	Nylon: neutral Silk: as for wool		<b>DYEING: OTHER FIBRES</b>
Wool, silk and nylon: direct Vigoureux printing	Wool, silk and nylon: direct Vigoureux printing		<b>PRINTING</b>
ISO  5 4 4-5 5 5  6-7 7 7-8  4 2-3 4-5 4-5  4-5 4-5 5 — — — 4-5 3-4 4	ISO  4 4-5 4-5 4 5  — 6-7 —  4-5 1-2 4-5 1-2  4 2 4-5 — — — 4 5 3-4		<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ - $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Fairly good 3 — 4			<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron
See Leather Dyes section	See Leather Dyes section	See Leather Dyes section	<b>NON-TEXTILE USAGE</b>
			<b>NOTES</b>

**C.I. Acid Blue 196—201**

<b>C.I. Acid Blue</b>	<b>196</b>	<b>197</b>	<b>198</b>
<b>CHEMICAL CLASS</b>		Phthalocyanine	Anthraquinone
<b>C.I. CONSTITUTION NUMBER</b>		—	—
<b>HUE</b> Daylight Artificial light (tungsten)		Greenish blue —	Bright blue Slightly redder
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	This C.I. Generic Name is discontinued		3  Good; very suitable for salting at boil — Acetate— <i>u</i> , cellulose— <i>ss</i> , silk— <i>hs</i>
<b>DYEING: OTHER FIBRES</b>			
<b>PRINTING</b>			Wool, silk and nylon: direct
<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool			ISO  4–5 4 2 3–4 4  6 6 6–7  2–3 3–4 3 2  1 2 3–4 1 1  3 2–3 4 1 2
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron			1 4 (duller) Greener and duller 4–5
<b>NON-TEXTILE USAGE</b>		Anodised aluminium: Fastness to light 8	
<b>NOTES</b>			<b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—decolorised; on diln— orange

199	200	201	C.I. Acid Blue
Monoazo (1 : 2 metal complex) —	Monoazo (1 : 2 metal complex) —	Monoazo (1 : 2 metal complex) —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Dull blue Redder	Dull blue Redder	Navy Slightly greener	HUE Daylight Artificial light (tungsten)
1, 2  Good; can be salted at boil Acetate, acrylic, cellulose and polyester—ss	1, 2  Good; can be salted at boil Acetate, acrylic, cellulose and polyester—ss	1, 2  Good; can be salted at boil Acetate, acrylic, cellulose and polyester—ss	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: Na <sub>3</sub> PO <sub>4</sub> +level- ling agent and acetic acid	Nylon: Na <sub>3</sub> PO <sub>4</sub> +levelling agent and acetic acid	Nylon: Na <sub>3</sub> PO <sub>4</sub> +levelling agent and acetic acid	DYEING: OTHER FIBRES
Wool, silk and nylon: direct	Wool, silk and nylon: direct	Wool, silk and nylon: direct	PRINTING
ISO  4-5 4 4 4-5 4  5-6 6 6-7  4-5 5 2 1-2  4 4-5 5 3-4 2  5 5 4 4-5 4-5	ISO  4 4-5 4-5 4-5 4  6 6-7 7  4-5 5 3-4 2-3  4 4 5 3-4 1-2  5 5 4-5 4-5 4-5	ISO  4-5 4-5 3-4 4-5 4-5  — 7 —  4 4-5 4 3  4-5 3-4 5 2-3 1  5 5 4-5 4-5 4	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool  Decatising  Light, $\frac{1}{2}$ - $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool  Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
4 4-5 Greener and duller 4 (duller)	3-4 4-5 Greener and duller 3-4 (greener and duller)	2-3 4-5 Unchanged 4-5	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
See Leather Dyes section		See Leather Dyes section	NON-TEXTILE USAGE
Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—navy; on diln—violet	Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—navy; on diln —violet	Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—bluish violet; on diln—violet	NOTES

C.I. Acid Blue	202	203	204
<b>CHEMICAL CLASS</b>	Monoazo (1 : 2 metal complex)	Anthraquinone	Anthraquinone
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Navy Redder	Bright blue Slightly redder	Bright blue Redder
<b>DYEING: WOOL</b> Method	1, 2	2	2
Levelling S.D.C. migration test method/grade Staining other fibres	Good; can be salted at boil — Acetate, acrylic, cellulose and polyester—ss	Good; can be salted at boil — Acetate—u, cellulose—ss	Good — Acetate and cotton—ss, viscose—u
<b>DYEING: OTHER FIBRES</b>	Nylon: Na <sub>3</sub> PO <sub>4</sub> +levelling agent and acetic acid	Silk: neutral or slightly acid	Silk: neutral or slightly acid
<b>PRINTING</b>	Wool, silk and nylon: direct	Wool, silk and nylon: direct	Wool, silk and nylon: direct
<b>FASTNESS PROPERTIES</b> Method	ISO	ISO	ISO
Alkali	4-5	4-5	4-5
Carbonising	4-5	4-5	4-5
Chlorination — alteration	4	3-4	3-4
staining wool	4-5	4-5	4
Decatising	4-5	4-5	4-5
Light, $\frac{1}{8}$ — $\frac{1}{2}$ normal	—	5-6	6
normal	7	6	6-7
2 × normal	—	6-7	7
Milling, alkaline — alteration	4	4-5	4
staining wool	4-5	4-5	4-5
Milling, acid — alteration	4	4-5	4-5
staining wool	3	4	4-5
Peroxide bleaching — alteration	4	4-5	3-4
staining wool	3	3	3
Perspiration	5	5	5
Potting — alteration	3	3-4	2
staining wool	1	2-3	2
Sea water — alteration	5	5	5
staining wool	5	5	5
Stoving	4-5	5	5
Washing — alteration	4-5	4	3-4
staining wool	4	4-5	4
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	2-3 4-5 Unchanged 4-5	1 4 (greener and duller) 4 (greener and duller) 4 (greener and duller)	1 4 (greener and duller) Greener and duller 4 (duller)
<b>NON-TEXTILE USAGE</b>			
<b>NOTES</b>	<b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—violet; on diln—no change	<b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—blue; on diln —violet	<b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—navy; on diln—blue



205	206	207	C.I. Acid Blue
Antraquinone —	Triarylmethane —	Azo —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Bright blue Slightly greener	Bright reddish blue Redder	Navy Slightly redder	HUE Daylight Artificial light (tungsten)
2 — Acetate and cellulose—ss, silk—hs	3 Good; can be salted at boil — Acetate—hs, cellulose and silk—ss		DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
		Nylon: ammonium acetate Staining—acetate 4–5, cel- lulose 4	DYEING: OTHER FIBRES
Wool, silk and nylon: direct	Wool: by discharge process		PRINTING
ISO 4 4–5 4 4 4–5  5–6 6 6–7  3 3–4 3–4 3–4  4 2–3 4–5 1–2 2–3  4–5 4 4 2–3 3–4	ISO 3–4 4–5 3 4 4  2 3 3–4  1 2 2 1  2 2–3 3–4 2 1  3–4 2–3 4–5 1 3–4	ISO 5 — — — 4–5*  4 6 —  — — — —  — — 5 — —  4–5 — — 5 —	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{8}$ – $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
1 4 (greener) Greener and duller 4 (greener and duller)	4 4 (duller) Greener and duller 4 (duller)	Not dischargeable — — —	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
			NON-TEXTILE USAGE
Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—faint olive; on diln—bluish pink	Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—greenish yel- low; on diln—yellowish green	*Hot pressing	NOTES

### C.I. Acid Blue 208—213

C.I. Acid Blue	208	209	210
CHEMICAL CLASS	Anthraquinone	—	Azo (1:2 metal complex)
C.I. CONSTITUTION NUMBER	—	—	—
HUE Daylight Artificial light (tungsten)	Reddish blue —	Blue (on nylon) —	Navy (on nylon) Redder
DYEING: WOOL Method	Suitable for package dyeing		
Levelling	—		
S.D.C. migration test method/grade	—		
Staining other fibres	Acetate— <i>vs</i> s, acrylic— <i>hs</i> , cotton— <i>s</i> , polyester— <i>ss</i>		
DYEING: OTHER FIBRES	Nylon: neutral or slightly acid Silk: neutral or ammonium acetate	Nylon: neutral or faintly alkaline with ammonia	Nylon: acetic acid
PRINTING	Wool, silk and nylon: direct	Nylon: direct	
FASTNESS PROPERTIES Method	Wool ISO Silk Nylon	ISO Nylon	ISO Nylon 6
Alkali	4-5 4-5 —	5	—
Carbonising	4-5 — —	4-5	—
Chlorination — alteration	4 5 5*	5	4-5*
staining wool	— — —	5	—
Decatising	4-5 — —	3-4	4-5
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	5 4-5 5-6	—	—
normal	5-6 5 6	6	7-8
2 × normal	6 5-6 6-7	—	—
Milling, alkaline — alteration	5 — —	4	—
staining wool	5 — —	5	—
Milling, acid — alteration	4-5 — —	4-5	—
staining wool	5 — —	3-4	—
Peroxide bleaching — alteration	4-5 4-5 —	4	—
staining wool	4-5 — —	4	—
Perspiration	5 5 5	4-5	5
Potting — alteration	— — —	3	—
staining wool	— — —	3	—
Sea water — alteration	5 5 5	5	4-5
staining wool	5 5 5	5	5
Stoving	4 — —	5	—
Washing — alteration	4-5 4-5 5	4-5	4-5
staining wool	5 — 5	4-5	5
OTHER PROPERTIES			
Dischargeability	2	Not dischargeable	
Effect of metals — copper	3 (greener)	5	
chromium	4 (greener)	—	
iron	—	5	
NON-TEXTILE USAGE		Furs	
NOTES	*Chlorinated water		*Chlorinated water

211	212	213	C.I. Acid Blue
	Formazan (metal complex) —	Triarylmethane —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
	Blue Greener	Blue Little redder	HUE Daylight Artificial light (tungsten)
This C.I. Generic Name is discontinued; the dyes formerly listed under it now appear under C.I. Acid Blue 193	1, 2	1, 2  Good — Acetate and cellulose—ss, acrylic and polyester—s, nylon—d	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
	Nylon: ammonium sulphate + sodium phosphate Silk Jute Sisal	Silk: neutral; exhaust with acetic acid	DYEING: OTHER FIBRES
	Wool, silk and nylon: direct	Wool and silk: direct	PRINTING
	ISO  4-5 4-5 4 5 3-4  5-6 6 6-7  4-5 4 3-4 4  4-5 4-5 5 3-4 3-4  5 5 3 4-5 3	ISO  2-3 4-5 — — 5  3-4 4 5  4 4-5 4-5 3  1 4 4-5 2 2  4 5 4 4 5	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool  Decatising  Light, $\frac{1}{8}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
	4-5 3 — 4	Discharge slightly tinted* Unchanged — Little duller	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
	See Leather Dyes section		NON-TEXTILE USAGE
		*Suitable for colour discharges Fastness to light on silk (ISO): 3, 3-4, 4-5	NOTES

# C.I. Acid Blue 214—220

C.I. Acid Blue	214& 215	216	217
<b>CHEMICAL CLASS</b>	—	Azo (metal complex)	—
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)		Reddish navy —	
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	These C.I. Generic Names are discontinued; the dyes previously listed under them now appear under C.I. Reactive Blue 19 and 36, respectively	3  Moderate — Acetate and cellulose—ss, silk—hs	This C.I. Generic Name is discontinued; dyes formerly listed under it now appear under C.I. Acid Blue 168
<b>DYEING: OTHER FIBRES</b>			
<b>PRINTING</b>			
<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool		AATCC  4 4 — — —  — 5-6 —  — — — — —  3 — — — —  4-5 — 5 — —	
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron		— Hue somewhat affected Little affected Hue somewhat affected	
<b>NON-TEXTILE USAGE</b>		See Leather Dyes section	
<b>NOTES</b>		Unaffected by Monel metal <b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—greenish black; on diln—violet	



218	219	220	C.I. Acid Blue
	Monoazo (1:2 metal complex) —	— —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
	— —	Blue Redder	HUE Daylight Artificial light (tungsten)
This C.I. Generic Name is discontinued; the dyes formerly listed under it now appear under C.I. Acid Blue 216	1, 2 Good; can be salted at boil — Acrylic, cellulose and polyester—ss	2 Good — Acetate, acrylic, polyester and viscose—ss, cotton—s	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
	Nylon: weakly alkaline, neutral or weakly acid Silk: neutral or acetic acid Bast fibres	Nylon: weakly acid; tannin-tartar emetic treatment improves wet fastness Silk: neutral or weakly acid	DYEING: OTHER FIBRES
	Wool, silk and nylon: direct Vigoureux printing		PRINTING
	ISO 4-5 4 4 — 4  5-6 6-7 7-8  4 4 4 3  3 2 4-5 3 1  4 4-5 4 4 4	Wool ISO Nylon Silk 4 — — 4 — — 3-4 — — 4-5 — — 4 — 5*  5-6 6-7 4-5 6 7 4-5 6 7 5  3 3-4 — 4 — — 4 — — 3-4 — —  3-4 — — 2-3 — — 4-5 5 4 2 — — 2 — —  4-5 5 — 4-5 — — 5 — 4-5 2-3 3-4 3 3 — —	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
	Not dischargeable 4-5 Little affected 3-4	Not dischargeable 4 (duller) 4 (greener and duller) 4-5	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
			NON-TEXTILE USAGE
		*Hot pressing Solubility: 50 g/l; suitable for package dyeing Suitable for hat felt dyeing	NOTES

**C.I. Acid Blue 221—227**

C.I. Acid Blue	221	222 & 223	224																																																																																																																																																																
CHEMICAL CLASS	—	—	—																																																																																																																																																																
C.I. CONSTITUTION NUMBER	—	—	—																																																																																																																																																																
HUE Daylight Artificial light (tungsten)	Bright blue Greener		Bright greenish blue Greener																																																																																																																																																																
DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres	Ammonium acetate  Fair — Acetate, cotton and polyester —ss, acrylic and viscose—u	These C.I. Generic Names are discontinued; the dyes formerly listed under them now appear under C.I. Direct Blue 250 and 251 respectively	2*  Moderate — Acetate—u, cotton—hs, nylon—d, viscose—ss																																																																																																																																																																
DYEING: OTHER FIBRES	Nylon: ammonium acetate; tannin aftertreatment improves fastness to light Silk: neutral or weakly acid		Silk: as for wool																																																																																																																																																																
PRINTING			Wool: direct																																																																																																																																																																
FASTNESS PROPERTIES Method	<table><thead><tr><th></th><th>Wool</th><th>ISO Silk</th><th>Nylon</th></tr></thead><tbody><tr><td>Alkali</td><td>4-5</td><td>—</td><td>—</td></tr><tr><td>Carbonising</td><td>4</td><td>—</td><td>—</td></tr><tr><td>Chlorination — alteration</td><td>3-4</td><td>—</td><td>—</td></tr><tr><td>                  staining wool</td><td>4</td><td>—</td><td>—</td></tr><tr><td>Decatising</td><td>4</td><td>—</td><td>—</td></tr><tr><td>Light, <math>\frac{1}{2}</math>—<math>\frac{1}{2}</math> normal</td><td>6</td><td>4-5</td><td>—</td></tr><tr><td>                  normal</td><td>6</td><td>4-5</td><td>7</td></tr><tr><td>                  2 × normal</td><td>6-7</td><td>5</td><td>7</td></tr><tr><td>Milling, alkaline — alteration</td><td>4</td><td>—</td><td>4-5</td></tr><tr><td>                  staining wool</td><td>4-5</td><td>—</td><td>—</td></tr><tr><td>Milling, acid — alteration</td><td>4</td><td>—</td><td>—</td></tr><tr><td>                  staining wool</td><td>4-5</td><td>—</td><td>—</td></tr><tr><td>Peroxide bleaching — alteration</td><td>4</td><td>—</td><td>—</td></tr><tr><td>                  staining wool</td><td>3-4</td><td>—</td><td>—</td></tr><tr><td>Perspiration</td><td>5</td><td>3-4</td><td>4-5</td></tr><tr><td>Potting — alteration</td><td>3-4</td><td>—</td><td>—</td></tr><tr><td>                  staining wool</td><td>3-4</td><td>—</td><td>—</td></tr><tr><td>Sea water — alteration</td><td>5</td><td>—</td><td>4-5</td></tr><tr><td>                  staining wool</td><td>5</td><td>—</td><td>—</td></tr><tr><td>Stoving</td><td>5</td><td>4-5</td><td>—</td></tr><tr><td>Washing — alteration</td><td>4</td><td>4</td><td>5</td></tr><tr><td>                  staining wool</td><td>4-5</td><td>—</td><td>—</td></tr></tbody></table>		Wool	ISO Silk	Nylon	Alkali	4-5	—	—	Carbonising	4	—	—	Chlorination — alteration	3-4	—	—	staining wool	4	—	—	Decatising	4	—	—	Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	6	4-5	—	normal	6	4-5	7	2 × normal	6-7	5	7	Milling, alkaline — alteration	4	—	4-5	staining wool	4-5	—	—	Milling, acid — alteration	4	—	—	staining wool	4-5	—	—	Peroxide bleaching — alteration	4	—	—	staining wool	3-4	—	—	Perspiration	5	3-4	4-5	Potting — alteration	3-4	—	—	staining wool	3-4	—	—	Sea water — alteration	5	—	4-5	staining wool	5	—	—	Stoving	5	4-5	—	Washing — alteration	4	4	5	staining wool	4-5	—	—	<table><thead><tr><th></th><th>ISO Wool</th><th>Silk</th></tr></thead><tbody><tr><td>Alkali</td><td>4</td><td>—</td></tr><tr><td>Carbonising</td><td>1</td><td>—</td></tr><tr><td>Chlorination — alteration</td><td>4-5</td><td>—</td></tr><tr><td>                  staining wool</td><td>5</td><td>—</td></tr><tr><td>Decatising</td><td>5</td><td>5†</td></tr><tr><td>Light, <math>\frac{1}{2}</math>—<math>\frac{1}{2}</math> normal</td><td>3-4</td><td>3-4</td></tr><tr><td>                  normal</td><td>4-5</td><td>4-5</td></tr><tr><td>                  2 × normal</td><td>4-5</td><td>5</td></tr><tr><td>Milling, alkaline — alteration</td><td>5</td><td>—</td></tr><tr><td>                  staining wool</td><td>5</td><td>—</td></tr><tr><td>Milling, acid — alteration</td><td>1</td><td>—</td></tr><tr><td>                  staining wool</td><td>5</td><td>—</td></tr><tr><td>Peroxide bleaching — alteration</td><td>4</td><td>—</td></tr><tr><td>                  staining wool</td><td>5</td><td>—</td></tr><tr><td>Perspiration</td><td>4-5</td><td>3-4</td></tr><tr><td>Potting — alteration</td><td>5</td><td>—</td></tr><tr><td>                  staining wool</td><td>2</td><td>—</td></tr><tr><td>Sea water — alteration</td><td>5</td><td>—</td></tr><tr><td>                  staining wool</td><td>5</td><td>—</td></tr><tr><td>Stoving</td><td>1</td><td>—</td></tr><tr><td>Washing — alteration</td><td>3-4</td><td>4-5</td></tr><tr><td>                  staining wool</td><td>5</td><td>—</td></tr></tbody></table>		ISO Wool	Silk	Alkali	4	—	Carbonising	1	—	Chlorination — alteration	4-5	—	staining wool	5	—	Decatising	5	5†	Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	3-4	3-4	normal	4-5	4-5	2 × normal	4-5	5	Milling, alkaline — alteration	5	—	staining wool	5	—	Milling, acid — alteration	1	—	staining wool	5	—	Peroxide bleaching — alteration	4	—	staining wool	5	—	Perspiration	4-5	3-4	Potting — alteration	5	—	staining wool	2	—	Sea water — alteration	5	—	staining wool	5	—	Stoving	1	—	Washing — alteration	3-4	4-5	staining wool	5	—
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OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron	Not dischargeable 3-4 (greener and duller) 4 (greener and duller) 3 (greener and duller)		3-4 4 3 4																																																																																																																																																																
NON-TEXTILE USAGE																																																																																																																																																																			
NOTES	Solubility: 60 g/l		*Brightest hue given by alkaline rinse; acid rinse gives a duller and greener hue †Hot pressing Solubility: 150 g/l at 90°C Very poor fastness on nylon																																																																																																																																																																

225	226	227	C.I. Acid Blue
— —	— —	Anthraquinone —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Reddish blue Redder	Blue Redder	Blue (wool)* Redder	HUE Daylight Artificial light (tungsten)
1 (pale dyeings), 2 — — Acetate and viscose— <i>u</i> , acrylic, cotton and polyester— <i>ss</i>	1 (pale dyeings), 2 — — Acetate and viscose— <i>u</i> , acrylic and cotton— <i>ss</i> , polyester— <i>hs</i>	1, 2 — — Acetate and viscose— <i>u</i> , cotton— <i>ss</i>	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: Na <sub>3</sub> PO <sub>4</sub> + (NH <sub>4</sub> ) <sub>2</sub> SO <sub>4</sub> Silk: neutral or weakly acid	Nylon: Na <sub>3</sub> PO <sub>4</sub> + (NH <sub>4</sub> ) <sub>2</sub> SO <sub>4</sub> Silk: as wool	Nylon: ammonium sulphate Silk: ammonium sul- phate or acetic acid	DYEING: OTHER FIBRES
Wool, silk and nylon: direct	Wool, silk and nylon: direct	Wool, silk and nylon: direct	PRINTING
<div> Wool ISO Silk Nylon </div> <div> 4 4 5 </div> <div> 5 — — </div> <div> 2-3 — — </div> <div> — 5* 5 </div> <div> 5 5 5-6 </div> <div> 6 5 6 </div> <div> 6-7 5-6 6-7 </div> <div> 4-5 — 4-5 </div> <div> 5 — — </div> <div> 5 — — </div> <div> 4 — — </div> <div> — — — </div> <div> — — — </div> <div> 5 4 5 </div> <div> 4-5 — 2-3 </div> <div> 2-3 — — </div> <div> 5 4 5 </div> <div> 5 — — </div> <div> — — — </div> <div> 5 — 5 </div> <div> 4-5 — — </div>	<div> Wool ISO Silk Nylon </div> <div> 4 4 4 </div> <div> 4 — 4 </div> <div> 2-3 — — </div> <div> — — — </div> <div> 4-5 5* 4 </div> <div> 5 5 5 </div> <div> 5-6 5 6 </div> <div> 6 5-6 6 </div> <div> 4-5 — — </div> <div> 5 — — </div> <div> 4 — 4 </div> <div> 5 — — </div> <div> — — — </div> <div> — — — </div> <div> 4-5 4 4 </div> <div> 4-5 — 1 </div> <div> 3 — — </div> <div> 4-5 5 4 </div> <div> 5 — — </div> <div> — — — </div> <div> 4-5 4 4-5 </div> <div> 5 — — </div>	<div> Wool ISO Nylon Silk </div> <div> 4-5 5 5 </div> <div> 5 5 — </div> <div> 5 4-5 — </div> <div> 5 5 — </div> <div> 4-5 4-5 — </div> <div> 4-5 6-7 4-5 </div> <div> 5-6 7 4-5 </div> <div> 6 7-8 5 </div> <div> 5 5 — </div> <div> 4 — — </div> <div> 5 — — </div> <div> 4 — — </div> <div> 5 — 2 </div> <div> 3-4 — — </div> <div> 5 5 5 </div> <div> 4 2-3 — </div> <div> 2 — — </div> <div> 4-5 5 5 </div> <div> 4-5 — — </div> <div> 4-5 5 5 </div> <div> 5 4 2-3 </div> <div> 4-5 — — </div>	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
— 3 Greener 4	2 3 (duller and weaker) Duller 5	2 4-5 (greener, duller) 4 (duller) 4-5 (greener, duller)	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
Woolled sheepskins	Woolled sheepskins	See Leather Dyes section	NON-TEXTILE USAGE
*Hot pressing  Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—blue; on diln— reddish blue	*Hot pressing Solubility: 100 g/l Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—blue; on diln— no change	*Reddish blue (nylon) Solubility: 90 g/l at 90°C	NOTES

### C.I. Acid Blue 228—233

C.I. Acid Blue	228	229	230	
CHEMICAL CLASS	Phthalocyanine	Monoazo	Anthraquinone	
C.I. CONSTITUTION NUMBER	—	—	—	
HUE Daylight Artificial light (tungsten)	Greenish blue Greener	Reddish navy —	Bright greenish blue Redder	
DYEING: WOOL Method	2	1, 2		
Levelling S.D.C. migration test method/grade Staining other fibres	Fair—moderate — Acetate, acrylic, cellulose and polyester— <i>vss</i>	Good — Acetate, acrylic, viscose and polyester— <i>u</i> , cotton and modacrylic— <i>s</i>		
DYEING: OTHER FIBRES	Silk	Nylon and silk: as for wool	Acetate: good build-up Nylon: alk., neutral or weakly acid; tannin tar emetic treatment improves wet fastness	
PRINTING	Wool and unweighted silk: direct. Nylon: Thermofix process		Acetate: unsuitable Nylon: usual methods	
FASTNESS PROPERTIES Method	Wool ISO Silk Nylon	ISO	AATCC Acetate Nylon ISO Wool	
Alkali	4-5	4	—	—
Carbonising	4-5	—	4-5	—
Chlorination — alteration	4-5	—	4-5	5*
staining wool	5	—	5	—
Decatising	4	5*	4-5	5
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal	5-6	6	—	4
normal	5-6	6	6	5
2 × normal	—	—	7	5-6
Milling, alkaline — alteration	4	—	4-5	—
staining wool	5	—	4	—
Milling, acid — alteration	4-5	3-4	4-5	—
staining wool	5	—	5	—
Peroxide bleaching — alteration	3-4	1-2	5	—
staining wool	5	—	4	—
Perspiration	4-5	4-5	4-5	5
Potting — alteration	4-5	—	4	—
staining wool	3-4	—	1-2	—
Sea water — alteration	4-5	4	5	—
staining wool	5	—	—	5
Stoving	4-5	4-5	—	—
Washing — alteration	4	3	4	—
staining wool	5	—	4	4
				—
OTHER PROPERTIES				
Dischargeability	Poor	Poor		Not dischargeable
Effect of metals — copper	3-4 (greener)	—		—
chromium	Greener, duller	—		—
iron	4 (duller)	—		—
NON-TEXTILE USAGE				
NOTES	*Hot pressing Solubility: 250 g/l	Solubility: 100 g/l  Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—reddish violet; on diln.—bluish violet	*Chlorinated water Solubility: 40 g/l	





**C.I. Acid Blue 234—239**

<b>C.I. Acid Blue</b>	<b>234</b>	<b>235</b>	<b>236</b>
<b>CHEMICAL CLASS</b>	Azo (metallised)	Anthraquinone	—
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Reddish navy Greener	Reddish blue —	
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	1, 2  — — Acetate and cotton—s, acrylic, polyester and viscose—ss		This C.I. Generic Name is discontinued; dyes formerly listed under it now appear under C.I. Acid Blue 207
<b>DYEING: OTHER FIBRES</b>	Nylon and silk: as for wool		
<b>PRINTING</b>	Wool, silk and nylon: direct Vigoureux printing		
<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool	ISO  4-5 — — — 4-5  — 4-5 — — 4 3-4 — — 4-5 2 4-5 4-5 1-2  5 4 — 5 5		
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	1 — — —		
<b>NON-TEXTILE USAGE</b>			
<b>NOTES</b>	Solubility: very good		

237	238	239	C.I. Acid Blue		
Trisazo —	Azine —	Anthraquinone —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER		
Dark Blue —	Bright blue Redder, duller	Greenish blue Greener	HUE Daylight Artificial light (tungsten)		
	—  — Acetate and viscose— vss, cotton—u	1, 2  Moderate — Acetate, polyester and viscose—ss, acrylic—u, cotton—s	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres		
		Nylon: ammonium sulphate and Na <sub>3</sub> PO <sub>4</sub> Silk: (pale dyeings) dispersing agent only, (medium to full dyeings) as for wool	DYEING: OTHER FIBRES		
			PRINTING		
	ISO  3-4 5 4-5 3-4 5  — — —  4 3-4 3-4 2-3  — 5 — — — — — — — —	Wool 4 4 2 — 4-5  5 5-6 6  4-5 5 5 5  — 5 4 2  5 5 — 4-5 5	ISO Silk 4 — — — —  4-5 4-5 4-5  — — — —  4-5 4 — —  — — — —  4-5 4 —	Nylon 4 4 — — 4-5  5 5-6 6  4-5 — — —  — — 3-4 —  5 — — 4-5 —	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
	1 5 — 5	2 4 Duller 5	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron		
See Leather Dyes sec- tion			NON-TEXTILE USAGE		
	Solubility: 50g/l	Solubility: 100 g/l at 90°C Suitable for goods to be vulcanised	NOTES		

### C.I. Acid Blue

1382



243	244	245	C.I. Acid Blue
Phthalocyanine —	Monoazo (metal complex) —	Anthraquinone —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Bright greenish blue —	Reddish blue —	Bright blue —	HUE Daylight Artificial light (tungsten)
			DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
			DYEING: OTHER FIBRES
			PRINTING
			FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{8}$ – $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
			OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
Anodised aluminium: Fastness—Light 8, Weather, very good	Anodised aluminium: Fastness to light 7	Anodised aluminium: Fastness—Light 8, Weather very good	NON-TEXTILE USAGE
			NOTES

# C.I. Acid Blue 246—251

C.I. Acid Blue	246	247	248																																																																								
CHEMICAL CLASS	Monoazo (metal complex)	Anthraquinone	—																																																																								
C.I. CONSTITUTION NUMBER	—	—	—																																																																								
HUE Daylight Artificial light (tungsten)	Greenish blue —	Reddish blue Redder																																																																									
DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres		1, 2  — — Acetate and viscose—u, cotton—ss	This C.I. Generic Name is discontinued; dyes formerly listed under it now appear under C.I. Acid Blue 239																																																																								
DYEING: OTHER FIBRES		Nylon: ammonium sulphate Silk: ammonium sulphate or soap bath broken with acetic acid																																																																									
PRINTING		Wool and silk: direct																																																																									
FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool		<table><tr><td></td><td>ISO</td><td></td></tr><tr><td>Wool</td><td>Silk</td><td>Nylon</td></tr><tr><td>5</td><td>5</td><td>5</td></tr><tr><td>5</td><td>—</td><td>5</td></tr><tr><td>5</td><td>—</td><td>3-4</td></tr><tr><td>5</td><td>—</td><td>—</td></tr><tr><td>5</td><td>5</td><td>5</td></tr><tr><td>5</td><td>4-5</td><td>6-7</td></tr><tr><td>6</td><td>5-6</td><td>7</td></tr><tr><td>6-7</td><td>6</td><td>7-8</td></tr><tr><td>5</td><td>—</td><td>5</td></tr><tr><td>4-5</td><td>—</td><td>—</td></tr><tr><td>5</td><td>—</td><td>—</td></tr><tr><td>4-5</td><td>—</td><td>—</td></tr><tr><td>5</td><td>—</td><td>—</td></tr><tr><td>3-4</td><td>—</td><td>—</td></tr><tr><td>5</td><td>5</td><td>5</td></tr><tr><td>5</td><td>—</td><td>—</td></tr><tr><td>2</td><td>—</td><td>—</td></tr><tr><td>5</td><td>—</td><td>—</td></tr><tr><td>5</td><td>—</td><td>—</td></tr><tr><td>5</td><td>—</td><td>—</td></tr><tr><td>5</td><td>4</td><td>4-5</td></tr><tr><td>5</td><td>—</td><td>—</td></tr></table>		ISO		Wool	Silk	Nylon	5	5	5	5	—	5	5	—	3-4	5	—	—	5	5	5	5	4-5	6-7	6	5-6	7	6-7	6	7-8	5	—	5	4-5	—	—	5	—	—	4-5	—	—	5	—	—	3-4	—	—	5	5	5	5	—	—	2	—	—	5	—	—	5	—	—	5	—	—	5	4	4-5	5	—	—	
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OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron		2 4-5 4 4-5																																																																									
NON-TEXTILE USAGE	Anodised aluminium: Fastness—Light 7-8, Weather, very good																																																																										
NOTES		Solubility: 40 g/l Useful for brightening mordant dyeings																																																																									

249	250	251	C.I. Acid Blue
Phthalocyanine 74220	Monoazo (metal complex) —	— —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Blue —	Navy (wool), Blue (nylon) Redder (wool), duller (nylon)		HUE Daylight Artificial light (tungsten)
Good — —	1, 2	This C.I. Generic Name is discontinued; dyes formerly listed under it now appear under C.I. Acid Blue 230	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Silk	Nylon: Reserve polyester-cotton—2-3, 3 Silk		DYEING: OTHER FIBRES
	Wool, silk and nylon: direct		PRINTING
	<div style="display: flex; justify-content: space-around;"> <span>Wool</span> <span>ISO Nylon</span> <span>Silk</span> </div> <div style="display: flex; justify-content: space-around;"> <span>—</span> <span>—</span> <span>—</span> </div> <div style="display: flex; justify-content: space-around;"> <span>—</span> <span>—</span> <span>—</span> </div> <div style="display: flex; justify-content: space-around;"> <span>—</span> <span>—</span> <span>—</span> </div> <div style="display: flex; justify-content: space-around;"> <span>—</span> <span>5</span> <span>—</span> </div> <div style="display: flex; justify-content: space-around;"> <span>5</span> <span>6-7</span> <span>4-5</span> </div> <div style="display: flex; justify-content: space-around;"> <span>5-6</span> <span>7-8</span> <span>5-6</span> </div> <div style="display: flex; justify-content: space-around;"> <span>6-7</span> <span>8</span> <span>6-7</span> </div> <div style="display: flex; justify-content: space-around;"> <span>—</span> <span>—</span> <span>—</span> </div> <div style="display: flex; justify-content: space-around;"> <span>—</span> <span>—</span> <span>—</span> </div> <div style="display: flex; justify-content: space-around;"> <span>—</span> <span>—</span> <span>—</span> </div> <div style="display: flex; justify-content: space-around;"> <span>—</span> <span>—</span> <span>—</span> </div> <div style="display: flex; justify-content: space-around;"> <span>5</span> <span>5</span> <span>4-5</span> </div> <div style="display: flex; justify-content: space-around;"> <span>—</span> <span>—</span> <span>—</span> </div> <div style="display: flex; justify-content: space-around;"> <span>—</span> <span>—</span> <span>—</span> </div> <div style="display: flex; justify-content: space-around;"> <span>5</span> <span>5</span> <span>5</span> </div> <div style="display: flex; justify-content: space-around;"> <span>4-5</span> <span>5</span> <span>—</span> </div> <div style="display: flex; justify-content: space-around;"> <span>—</span> <span>—</span> <span>—</span> </div> <div style="display: flex; justify-content: space-around;"> <span>3-4</span> <span>4-5</span> <span>3-4</span> </div> <div style="display: flex; justify-content: space-around;"> <span>3-4</span> <span>5</span> <span>—</span> </div>		FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ - $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Not dischargeable Affected — Affected	4, 2 — — —		OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
Cosmetics			NON-TEXTILE USAGE
	Solubility: 80 g/l		NOTES

**C.I. Acid Blue 252—255**

<b>C.I. Acid Blue</b>	<b>252</b>	<b>253</b>
<b>CHEMICAL CLASS</b>	Monoazo (1:2 metal complex)	Anthraquinone
<b>C.I. CONSTITUTION NUMBER</b>	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Reddish navy Redder	Greenish blue Greener
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	At 100–105°C, heavy dyeings only — — Acrylic, cellulose, polyester and triacetate —s	3  Good — Acetate, cellulose and polyester—ss, acrylic— vss, silk and nylon brighter than wool
<b>DYEING: OTHER FIBRES</b>	Nylon: at 100–120°C Silk	
<b>PRINTING</b>	Wool, nylon, acrylic and triacetate: direct	
<b>FASTNESS PROPERTIES</b> Method	ISO	ISO
Alkali	—	3–4
Carbonising	4	4
Chlorination — alteration	4	4
staining wool	—	4
Decatising	4–5	4
Light, $\frac{1}{3}$ – $\frac{1}{2}$ normal	6	5–6
normal	6–7	6
2 × normal	—	6
Milling, alkaline — alteration	4–5	4
staining wool	4	4
Milling, acid — alteration	4–5	3–4
staining wool	4–5	2–3
Peroxide bleaching — alteration	4–5	2
staining wool	4–5	2–3
Perspiration	5	3–4
Potting — alteration	—	—
staining wool	—	—
Sea water — alteration	5	3–4
staining wool	5	2–3
Stoving	—	4–5
Washing — alteration	4–5	3
staining wool	4	4
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	2–3 — — —	Not dischargeable 4 4 3
<b>NON-TEXTILE USAGE</b>		
<b>NOTES</b>	Fastness properties on acrylic, nylon and triacetate are generally similar to those on wool	Solubility: 80 g/l



254	255	C.I. Acid Blue
Phthalocyanine (copper) —	Phthalocyanine —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Greenish blue Greener	Greenish blue —	HUE Daylight Artificial light (tungsten)
		DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
		DYEING: OTHER FIBRES
		PRINTING
		FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{8}$ – $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Not dischargeable — — —		OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
See Leather Dyes section Paper: Beater dyeing; fairly good substantivity for the usual paper-making fibres, improved by rosin/alum sizing. High affinity for clay (C.I. Pigment White 19). Optimum pH 4·5–6·0. Fastness: Light 5, H <sub>2</sub> SO <sub>4</sub> 10% 4, acetic acid 30% 5, alum 10% 5, NaOH 10% 5, sodium silicate 40°Bé 5 Resistant to oxidation and reduction bleaches Does not bleed into water Solubility: 2 g/l at 20°C, 3 g/l at 60°C	Paper: beater and surface dyeing	NON-TEXTILE USAGE
	Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—yellowish green; on diln—blue soln→blue ppt.	NOTES

**C.I. Acid Blue 256—261**

C.I. Acid Blue	256	257	258			
CHEMICAL CLASS	Azo (1:2 metal complex)	Anthraquinone	Anthraquinone			
C.I. CONSTITUTION NUMBER	—	—	—			
HUE Daylight Artificial light (tungsten)	Reddish navy Redder	Blue Redder	Greenish blue Redder, duller			
DYEING: WOOL Method	1, 2	2	3			
Levelling	4	3-4	—			
S.D.C. migration test method/grade	—	—	—			
Staining other fibres	—	—	Acrylic, cellulose and poly- ester—u			
DYEING: OTHER FIBRES	Nylon		Nylon: ammonium sulphate, acetic or formic acid Silk			
PRINTING						
FASTNESS PROPERTIES Method	ISO		ISO			
	Wool	Nylon		Wool	Nylon	Silk
Alkali	—	—	—	3	3-4	2-3
Carbonising	4-5	—	4-5	4	—	—
Chlorination — alteration	4	—	—	—	4*	—
staining wool	4-5	—	—	—	—	—
Decatising	4-5	—	5	4	—	—
Light, ½ — normal	—	—	5	—	6	—
normal	7	7-8	5-6	5-6	6	—
2 × normal	—	—	6	—	—	—
Milling, alkaline — alteration	4	—	3-4	—	—	—
staining wool	4	—	—	2-3	—	—
Milling, acid — alteration	—	4-5	4-5	—	—	—
staining wool	—	4-5	—	—	—	—
Peroxide bleaching — alteration	—	—	—	—	—	—
staining wool	—	—	—	—	—	—
Perspiration	5	5	4-5	4-5	4-5	3
Potting — alteration	2-3	—	4	—	—	5
staining wool	1	—	3-4	—	—	—
Sea water — alteration	5	5	2-3	3-4	4-5	—
staining wool	5	5	—	3-4	—	—
Stoving	—	—	—	—	—	—
Washing — alteration	5	5	5	4-5	3	—
staining wool	5	5	4-5	4	—	—
OTHER PROPERTIES Dischargeability		2	2			
Effect of metals — copper		—	5			
chromium		—	—			
iron		—	3-4 (weaker, duller)			
NON-TEXTILE USAGE						
NOTES	Solubility: 40 g/l	Solubility: 33 g/l	*Chlorinated water Solubility: 90 g/l at 90°C			

259	260	261	C.I. Acid Blue	
Azo (metal complex) —	Anthraquinone —	Anthraquinone —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER	
Reddish navy Redder	Blue Redder	Blue Redder	HUE Daylight Artificial light (tungsten)	
	2  3 — —	2  Good — Acetate and viscose— <i>u</i> , acrylic — <i>u-s</i> , cotton and polyester— <i>ss</i>	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres	
Nylon	Nylon	Nylon: ammonium sulphate, acetic or formic acid Silk: ammonium sulphate; ex- haust with acetic acid	DYEING: OTHER FIBRES	
		Nylon: direct	PRINTING	
ISO Nylon — — 4-5* — —  — 7-8 —  — — — —  — — 4-5 — —  4-5 — — 4 —	Wool 4 5 4-5 5 5  5-6 6 6  3-4 4 — —  — — 4-5 — — 4-5 — — 4 4 2 2-3	ISO Nylon 5 — 5* — —  6 6-7 6-7  — — — —  4-5 4-5 — — 4-5 4 — 4 — 2 4 —	Silk 4 — — — —  5 5-6 6  — — — —  4 4-5 5-6  — — — —  3-4 — — — 2-3 —	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ – $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
— 5 — 5	2 5 — 5	2 3 (greener, duller) — 3 (greener, duller)	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron	
			NON-TEXTILE USAGE	
*Chlorinated water Fastness on nylon 6 slight- ly better than on nylon 6-6 and may be improved on both fibres by after- treatment	*Chlorinated water Solubility: 70 g/l at 90°C Moderate stability to hard water	*Chlorinated water	NOTES	

C.I. Acid Blue	262	263	264
CHEMICAL CLASS	Disazo	Disazo (metallised)	Anthraquinone
C.I. CONSTITUTION NUMBER	—	—	—
HUE	Blue	Blue	Bright blue
Daylight Artificial light (tungsten)	—	—	—
DYEING: WOOL			
Method			
Levelling S.D.C. migration test method/grade Staining other fibres			
DYEING: OTHER FIBRES		Nylon: neutral or slightly acid	Nylon
PRINTING			
FASTNESS PROPERTIES			ISO
Method			Nylon
Alkali		—	5
Carbonising		—	—
Chlorination — alteration		—	4*
staining wool		—	—
Decatising		—	4
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal		7 (0.25%)	6
normal		7-8 (1%)	6-7
2 × normal		—	7
Milling, alkaline — alteration		—	4-5
staining wool		—	5
Milling, acid — alteration		—	—
staining wool		—	—
Peroxide bleaching — alteration		—	—
staining wool		—	—
Perspiration		—	4-5
Potting — alteration		—	—
staining wool		—	—
Sea water — alteration		—	4-5
staining wool		—	4-5
Stoving		—	—
Washing — alteration		4-5	5 (40°C), 4-5 (60°C)
staining wool		5	5, 4-5 (60°C)
OTHER PROPERTIES			
Dischargeability			
Effect of metals — copper			
chromium			
iron			
NON-TEXTILE USAGE	See Leather Dyes section		
NOTES		Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—dull bor- deaux; on diln—weak bor- deaux soln	*Chlorinated water



265	266	267	C.I. Acid Blue
Azo (metal complex) —	Anthraquinone —	Monoazo (1 : 2 metal complex) —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Reddish blue —	Blue Redder, duller	Navy Redder, duller	HUE Daylight Artificial light (tungsten)
		1, 2 — — —	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
	Nylon: at pH 4-5	Nylon	DYEING: OTHER FIBRES
			PRINTING
ISO Nylon and Silk — — — — — — 5 — — — — — — — — 4 — — — 4-5 —	ISO Nylon 3-4 — 4-5* — — 4-5 5 5-6 — — — — — — — 4-5 4-5 — 4-5 4-5	ISO Nylon — — 5* — 5 — 7 — — — — — — — — 5 5 — 5 4-5	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
		2 — — —	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
See Leather Dyes section			NON-TEXTILE USAGE
Solubility: 15 g/l	*Chlorinated water See also C.I. Reactive Blue 61	*Chlorinated water	NOTES

C.I. Acid Blue	268	269	270
CHEMICAL CLASS	Monoazo (chromium complex)	Triphenylmethane	Trisazo
C.I. CONSTITUTION NUMBER	—	42634	—
HUE Daylight Artificial light (tungsten)	Blue —		Reddish blue —
DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres	3  Good — Acetate— <i>u</i> , acrylic, cotton and polyester— <i>vs</i> s, silk— <i>s</i>		
DYEING: OTHER FIBRES			
PRINTING	Silk and wool		
FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool	ISO  4 4-5 4 4 4-5 (mild)  5 6 6-7  3-4 3-4 4 2-3  3-4 (redder) 4 4-5 (alkaline) 4 2  4-5 4-5  4 (ISO 3) 4-5		
OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron	4 4-5 — 4-5		
NON-TEXTILE USAGE		See Leather Dyes section	See Leather Dyes section
NOTES	Solubility in water: very good		

271	272	273	C.I. Acid Blue
Anthraquinone —	Anthraquinone —	Anthraquinone —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Blue Redder	Blue Slightly greener	Blue Slightly greener	HUE Daylight Artificial light (tungsten)
	— 4-5 — Acetate—s, acrylic—u, cotton—ss, polyester—ss, viscose—vss	Acetic acid + Glauber's salt — III/2 Cotton—ss	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: ammonium sul- phate		Nylon: acetic acid Silk: as wool	DYEING: OTHER FIBRES
	Wool, silk and nylon: direct	Direct on nylon and wool	PRINTING
ISO Nylon — — 5* — 5  6 6-7 7  — — — —  — — 5 — —  5 4-5 — 5 4-5	Wool 4 4-5 4-5 — 5  5 5-6 5-6  4-5 4-5 4-5 3-4  — — 5 — —  5 4-5 4-5 4 4	ISO Silk 4 — — — —  3-4 4 4  — — — —  — — 4 — —  3-4 — 4 — —	Nylon — — — — —  5-6 6 6-7  — — — —  4-5 — — —  4-5 — — 4 — —
		JIS 5 — — — —  4 4-5 5-6  2 1 5 4-5  3 1-2 4-5 2 1  5 4-5 — 3-4 3	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ – $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
2 — — —	2 2-3 (greener, duller) 2 (greener, duller) 3 (greener, duller)	— — Slightly duller —	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
			NON-TEXTILE USAGE
*Chlorinated water Solubility: 55 g/l	Solubility: 100 g/l		NOTES

**C.I. Acid Blue 274—279**

<b>C.I. Acid Blue</b>	<b>274</b>	<b>275</b>	<b>276</b>
<b>CHEMICAL CLASS</b>	Anthraquinone	Phthalocyanine	Azo (metallised)
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Bright blue Slightly redder	Greenish blue (nylon) Yellower	Blue —
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	Neutral (ammonium salt) or acetic acid Moderate — Cotton— <i>vss</i>		1, 2 — — Cotton— <i>ss</i> , nylon— <i>hs</i> , silk— <i>hs</i>
<b>DYEING: OTHER FIBRES</b>	Nylon: neutral (ammonium salt) or acetic acid + levelling agent Silk: neutral or weakly acid	Nylon: acetic acid Suitable for silk and wool	Nylon and silk: neutral or weakly acid
<b>PRINTING</b>	Direct on nylon, silk and wool	Direct on nylon, silk, and wool	Direct on nylon, silk, and wool
<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool	JIS  5 — — — —  5 5-6 6-7  4-5 4-5 5 5  4-5 4 5 5 4  4-5 5 — 5 5 5	JIS  — — — — —  2 2 3-4  — — — —  — — — 4-5 1-2  5 5 (nylon 6) — 5 5 (nylon 6)	
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	— — 3 (duller) —	— Weaker — Much greener	
<b>NON-TEXTILE USAGE</b>		Paper: beater dyeing and surface colouring	
<b>NOTES</b>			



277	278	279	C.I. Acid Blue
Anthraquinone —	Anthraquinone —	Phthalocyanine —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Blue Slightly redder	Blue Duller, redder	Greenish blue Greener	HUE Daylight Artificial light (tungsten)
3 Suitable for high temp. dyeing 3-4 — —			DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon; acetic acid; good level- ling. Suitable for high temp. dyeing	Nylon	Nylon Acrylic, polyester and tri- acetate—u, cellulose—s	DYEING: OTHER FIBRES
			PRINTING
ISO Wool      Nylon 3          4 4          — 4-5      4* 5          — 4-5      4-5  5          5-6 6          6 6-7      —  4-5      — 3          — —          — —          —  —          — —          — 4-5      4-5 —          — —          —  4-5      — 3-4      — —          — 2-3      3 3-4      —	ISO Nylon — — 5* — 5  6-7 7-8 8  — — — —  — — — —  5 4-5 — 4-5 4-5	ISO Nylon 5 — 3-4* — 4  — 4 4-5  3-4 5 — —  — — — 4  3-4 5 — 4-5 5	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool  Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool  Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool  Perspiration Potting — alteration staining wool  Sea water — alteration staining wool  Stoving Washing — alteration staining wool
2 3 (greener, duller) — 3 (greener, duller)	2 — — —		OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
			NON-TEXTILE USAGE
*Chlorinated water Solubility: 100 g/l	*Chlorinated water Solubility: 40 g/l	*Chlorinated water	NOTES

# C.I. Acid Blue 280

<b>C.I. Acid Blue</b>	<b>280</b>	
<b>CHEMICAL CLASS</b>	Anthraquinone	
<b>C.I. CONSTITUTION NUMBER</b>	—	
<b>HUE</b> Daylight Artificial light (tungsten)	Greenish blue Greener	
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres		
<b>DYEING: OTHER FIBRES</b>	Nylon: ammonium sulphate	
<b>PRINTING</b>		
<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool	ISO Nylon — — 5* — 5  6-7 7 7-8  — — — —  — — 5 — —  5 4-5 — 5 4-5	
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	2 — — —	
<b>NON-TEXTILE USAGE</b>		
<b>NOTES</b>	*Chlorinated water Solubility: 100 g/l	

# C.I. Acid Green 1—3

C.I. Acid Green	1	2	3
CHEMICAL CLASS	Nitroso	Monoazo	Triphenylmethane
C.I. CONSTITUTION NUMBER	10020	18775	42085
HUE Daylight Artificial light (tungsten)	Yellowish green Little change	Green Yellower	Bright green Slightly bluer and brighter
DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres	3  Moderate — Cellulose and acetate— <i>u</i>	1, 2, 3  — 1/2 Cellulose— <i>ss</i> , acetate— <i>u</i>	3  Good; can be salted at boil — Cellulose and acetate— <i>u</i>
DYEING: OTHER FIBRES	Nylon: formic acid	Silk: broken degumming liquor	Silk: broken degumming liquor
PRINTING		Direct on wool and silk	Direct on wool and silk
FASTNESS PROPERTIES Method	AATCC	ISO	AATCC
Alkali	4-5	4-5	1
Carbonising	3	2-3	3
Chlorination — alteration	3	2-3	—
staining wool	—	—	—
Decatising	3	3	5
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal	—	6	1
normal	6-7	7	2
2 × normal	—	7-8	3
Milling, alkaline — alteration	3	3	1
staining wool	—	1	—
Milling, acid — alteration	—	1	—
staining wool	—	—	—
Peroxide bleaching — alteration	2	3-4	1
staining wool	—	—	—
Perspiration	3-4	3-4	3
Potting — alteration	4	2-3	—
staining wool	—	—	—
Sea water — alteration	4-5	4	5
staining wool	—	—	—
Stoving	4	3	1
Washing — alteration	2-3	3	1
staining wool	—	—	3
OTHER PROPERTIES			
Dischargeability	Moderate	Moderate	Good
Effect of metals — copper	Slightly yellower	Slightly duller	Slightly bluer and duller
chromium	—	Unaffected	Unaffected
iron	Weaker and duller	Duller	Slightly weaker and duller
NON-TEXTILE USAGE	Anodised aluminium External drugs and cosmetics See Leather Dyes section Paper See C.I. Pigment Green 12 Soap	Pigments Paper	Barium and aluminium salts used as pigments Paper, wood stains, biological stain and indicator See C.I. Food Green 1 See Leather Dyes section
NOTES			

### C.I. Acid Green

1398



7	8	9	C.I. Acid Green
Triphenylmethane 42055	Triphenylmethane 42050	Triphenylmethane 42100	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Bright bluish green Bluer	Bright green Little change	Bright bluish green Slightly yellower	HUE Daylight Artificial light (tungsten)
3 — I/3-4 Cellulose and acetate— <i>ss</i>	3 Good; can be salted at boil — Acetate— <i>ss</i> , cellulose— <i>u</i>	3 — I/3 Cellulose and acetate— <i>vss</i>	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: formic or sulphuric acid Silk: broken degumming liquor Jute	Silk: broken degumming liquor	Nylon (pale dyeings): formic acid Silk: neutral, acetic or sulphuric acid	DYEING: OTHER FIBRES
Direct on wool and silk	Direct on wool and silk	Direct on wool, silk and viscose	PRINTING
AATCC                      ISO	ISO	AATCC                      ISO	FASTNESS PROPERTIES Method
4                      4-5	4-5	1                      2	Alkali
3                      3	4-5	4-5                      3	Carbonising
—                      3-4	1	4                      3-4	Chlorination — alteration
—                      5	—	4                      5	staining wool
4                      4	5	4                      4	Decatising
—                      2	2	—                      2	Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal
2                      3	3	2                      2	normal
—                      3	3	—                      3	2 × normal
3                      1	3	2                      1	Milling, alkaline — alteration
3                      1	—	2                      4	staining wool
—                      3-4	3	—                      3-4	Milling, acid — alteration
—                      1	—	—                      1	staining wool
—                      1	2	1                      1	Peroxide bleaching — alteration
—                      1	—	1                      5	staining wool
3                      3	3	3                      4	Perspiration
—                      —	—	4                      2	Potting — alteration
—                      —	—	4                      1	staining wool
5                      3	3	3-4                      4	Sea water — alteration
5                      3	—	3-4                      2	staining wool
4                      4-5	4	4-5                      3	Stoving
3                      2-3	3	2-3                      2	Washing — alteration
3                      3	2-3	2-3                      2	staining wool
Good Slightly duller Unaffected Duller	Moderate to good Somewhat duller Unaffected Much duller and weaker	Moderate Slightly duller Unaffected Duller and yellower	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
Paper Plastics See C. I. Solvent Green 15 See Leather Dyes section	Paper Pigments Soap Wood stains	Aluminium salt for paper coating Paper Biological stain Drugs and cosmetics See Leather Dyes section	NON-TEXTILE USAGE
			NOTES

# C.I. Acid Green 10—15

C.I. Acid Green	10	11	12
<b>CHEMICAL CLASS</b>	Anthraquinone	Triphenylmethane	Monoazo (metallised)
<b>C.I. CONSTITUTION NUMBER</b>	—	42038	13425
<b>HUE</b> Daylight Artificial light (tungsten)	Green No change	Bright bluish green Slightly yellower	Bluish green Little change
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	1, 2  Moderate — Silk— <i>ss</i> , cellulose and acetate— <i>u</i>	3  Good; can be salted at boil — Cellulose and acetate— <i>u</i>	3  Good — Cellulose and acetate— <i>ss</i>
<b>DYEING: OTHER FIBRES</b>	Nylon: acid dye bath	Nylon and silk: acid	Nylon: formic acid Silk: broken degumming liquor, acetic acid
<b>PRINTING</b>		Direct on wool and silk	Direct on wool, silk and nylon
<b>FASTNESS PROPERTIES</b> Method	AATCC	AATCC ISO	AATCC ISO
Alkali	4-5	5 3	3 4
Carbonising	5	3 4	3 4
Chlorination — alteration	—	— 1	— 3
staining wool	—	—	—
Decatising	—	3 5	3-4 3-4
Light, $\frac{1}{8}$ — $\frac{1}{2}$ normal	—	3 1	5 5
normal	8	3 1	6 5-6
2 × normal	—	3 1-2	6 6
Milling, alkaline — alteration	3-4	1 2-3	3-4 3-4
staining wool	—	—	3-4 4-5
Milling, acid — alteration	—	—	— 3-4
staining wool	—	—	— 3-4
Peroxide bleaching — alteration	—	— 1	1 2
staining wool	—	—	—
Perspiration	4	3 2-3	4 4
Potting — alteration	3-4	—	— 3
staining wool	—	—	—
Sea water — alteration	4-5	3 2-3	3-4 3-4
staining wool	—	—	—
Stoving	5	4-5 4	5 5
Washing — alteration	4	3 3	3 3-4
staining wool	—	—	3 4
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Moderate Unchanged Unchanged Slight change	Good Much duller — Slightly duller	Good Bluer Unaffected Redder and duller
<b>NON-TEXTILE USAGE</b>		Casein plastics Paper See Leather Dyes section	Anodised aluminium Paper See Leather Dyes section
<b>NOTES</b>	Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—dark blue		

<b>13</b>	<b>14</b>	<b>15</b>	<b>C.I. Acid Green</b>
Triphenylmethane <b>42046</b>	Triphenylmethane <b>42047</b>	Triphenylmethane <b>42105</b>	<b>CHEMICAL CLASS</b> <b>C.I. CONSTITUTION NUMBER</b>
Bluish green Yellower	Green Yellower	Bright green Slightly yellower	<b>HUE</b> Daylight Artificial light (tungsten)
3  Good; can be salted at boil — —	3  Good — —	1, 2  Good — Cellulose and acetate—ss	<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres
Silk: broken degumming liquor	Silk: neutral or broken degumming liquor	Nylon: acetic or formic acid Silk: acetic acid	<b>DYEING: OTHER FIBRES</b>
		Direct on wool and silk	<b>PRINTING</b>
<b>ISO</b> 4-5 4 1 — 5  — 2 —  2 — — —  1 — 3 — —  2-3 — 4 2-3 2-3	<b>AATCC</b> 2 4 1 — 5  1 1 1-2  2-3 — — —  1 — 3 — —  2-3 — 3 2-3 2-3	<b>AATCC</b> 3 3 — — 3  — 4 — — —  — — 4 — —  3 — — 3 —	<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{8}$ - $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
— Duller — Weaker and duller	Moderate Little change — Somewhat weaker	Moderate Much bluer and little duller — Slightly duller	<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron
		Casein plastics See Leather Dyes section Paper	<b>NON-TEXTILE USAGE</b>
			<b>NOTES</b>

# C.I. Acid Green 16—20

C.I. Acid Green	16	17
CHEMICAL CLASS	Triphenylmethane	Anthraquinone
C.I. CONSTITUTION NUMBER	44025	—
HUE Daylight Artificial light (tungsten)	Green Little change	Green (acetate), dull green (nylon) Little yellower
DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres	3  — I/3-4 Cellulose and acetate—u	
DYEING: OTHER FIBRES	Nylon: formic acid Silk: broken degumming liquor	Acetate and nylon from neutral or slightly acid solution. Can be used for package dyeing Silk and wool dyed more heavily than acetate, cellulose slightly stained
PRINTING	Direct on wool and silk	Direct on nylon
FASTNESS PROPERTIES Method	AATCC	ISO
Alkali	2	3-4
Carbonising	3-4	3
Chlorination — alteration	—	3-4
staining wool	—	5
Decatising	5	5
Light, $\frac{1}{2}$ — $\frac{1}{4}$ normal	—	2
normal	2	3
2 × normal	—	3
Milling, alkaline — alteration	2	1
staining wool	2	1
Milling acid — alteration	—	3-4
staining wool	—	1
Peroxide bleaching — alteration	1	1
staining wool	1	5
Perspiration	3-4	4-5
Potting — alteration	—	1
staining wool	—	1
Sea water — alteration	3	4
staining wool	3	2
Stoving	4	3-4
Washing — alteration	2-3	3
staining wool	2-3	3
OTHER PROPERTIES		
Dischargeability	Moderate to good	
Effect of metals — copper	Duller	
chromium	Unaffected	
iron	Much weaker and duller	
NON-TEXTILE USAGE	Inks, feathers, straw and soap See Leather Dyes section Paper Phenol- and urea-formaldehyde moulding powders	Pastel dyeings on woolled sheepskins and furs
NOTES		*Fastness on nylon: Light 5, 5, 5-6, Perspiration 5, Washing 5 H <sub>2</sub> SO <sub>4</sub> conc.—dull green



18	19	20	C.I. Acid Green	
Triphenylmethane 42155	Disazo 20440	Disazo 20495	CHEMICAL CLASS C.I. CONSTITUTION NUMBER	
Greenish blue —	Dull bluish green Slightly redder	Dull bluish green→greenish black Slightly yellower	HUE Daylight Artificial light (tungsten)	
3  Good — Cellulose and acetate— <i>u</i>	2  — IV/2 Cellulose and acetate — <i>s</i>	2, 3  — I/4 Cellulose— <i>ss</i> , acetate— <i>u</i>	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres	
Silk: formic or sulphuric acid	Silk: neutral or acetic acid	Silk: acetic or sulphuric acid	DYEING: OTHER FIBRES	
Direct on wool and silk	Direct and as dischargeable ground on wool and silk	Direct on wool, silk and nylon	PRINTING	
ISO  2 4 1 — 4-5  2 2 3  2 — 3 —  1 — 3-4 — —  3 — 4 2 3-4	ISO  4-5 3 4 5 4  2 3 3  3-4 3 3-4 1  4 2 4 2 1  4 5 3-4 3 4-5	AATCC  4-5 4 — — 5  2 3 4  2-3 2-3 — —  2-3 2-3 3 — —  3 3 4 2-3 2-3	ISO  4-5 4-5 4 4 1 4  3 3-4 4  1 1 4 1 2 4-5 3 1  4 1 4-5 3 1	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Moderate to good Slightly duller Unchanged Somewhat duller and weaker	Good Weaker — Weaker and yellower	Moderate Little change Unaffected Slightly weaker and duller	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron	
Paper Pigments Wood stains	See Leather Dyes section	Anodised aluminium Paper See Leather Dyes section	NON-TEXTILE USAGE	
			NOTES	

# C.I. Acid Green 21—25:1

C.I. Acid Green	21	22	23
<b>CHEMICAL CLASS</b>	Azo (metallised)	Triphenylmethane	
<b>C.I. CONSTITUTION NUMBER</b>	—	42170	—
<b>HUE</b> Daylight Artificial light (tungsten)	Green —	Green Little change	Green Slightly duller
<b>DYEING: WOOL</b> Method	3	3	3
Levelling S.D.C. migration test method/grade Staining other fibres	Moderate — Silk— <i>hs</i> , cellulose— <i>ss</i>	Good — Cellulose and acetate— <i>u</i>	Moderate — Silk and cellulose— <i>s</i> , acetate— <i>u</i>
<b>DYEING: OTHER FIBRES</b>		Nylon: formic acid Silk: broken degumming liquor	
<b>PRINTING</b>		Direct on wool and silk	
<b>FASTNESS PROPERTIES</b> Method	ISO	AATCC	ISO
Alkali	4	1-2	4
Carbonising	4-5	3-4	3
Chlorination — alteration	4	—	—
staining wool	—	—	—
Decatising	4	5	3-4
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal	5-6	1	5
normal	6	2	5-6
2 × normal	6	3	6
Milling, alkaline — alteration	4	2	3-4
staining wool	—	—	3
Milling, acid — alteration	4	—	2
staining wool	—	—	1-2
Peroxide bleaching — alteration	3	1	1
staining wool	—	—	3-4
Perspiration	4-5	3-4	4
Potting — alteration	2-3	—	—
staining wool	—	—	—
Sea water — alteration	4	3-4	4
staining wool	—	—	3
Stoving	4-5	4	4-5
Washing — alteration	4-5	3	3
staining wool	5	3	3-4
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	— Duller Unaffected Little duller	Moderate to good Duller Unaffected Weaker	Good Somewhat duller Unaffected Slightly duller
<b>NON-TEXTILE USAGE</b>		Biological stain Paper Pigments Soap Wood stains See Leather Dyes section	
<b>NOTES</b>			

24	25	25:1	C.I. Acid Green
Azo (metallised) —	Anthraquinone 61570	Anthraquinone —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Green —	Bluish green Very slightly duller	Bluish green Very slightly duller	HUE Daylight Artificial light (tungsten)
3  Good — —	2  — III/2 Cellulose—u	Chemically slightly different from C.I. Acid Green 25 but very similar in properties and uses	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
	Nylon: acetic or formic acid Silk: neutral or acetic acid	—	DYEING: OTHER FIBRES
	Direct on wool, silk and nylon	—	PRINTING
AATCC  — 5 — — 2-3  — 5-6 —  3 — — —  — — 5 — —  4 — 5 4-5 —	AATCC  4 5 — — 5  4 5 6  3-4 3-4 — —  3 3 3 —  4 4 5 4	ISO  4-5 3 3 5 4  6 6 6-7  1 1 3 1  2 1 4 2 1  4 3-4 4 3 2	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatsising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
	Poor Little change Unchanged Slightly duller		OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
See Leather Dyes section	Anodised aluminium Biological stain Drugs and cosmetics Paper See Leather Dyes section Soaps. Wood stains Urea and melamine resins		NON-TEXTILE USAGE
			NOTES

**C.I. Acid Green 26—31**

<b>C.I. Acid Green</b>	<b>26</b>	<b>27</b>	<b>28</b>
<b>CHEMICAL CLASS</b>	—	Anthraquinone	—
<b>C.I. CONSTITUTION NUMBER</b>	—	61580	—
<b>HUE</b> Daylight Artificial light (tungsten)		Bluish green Yellower	Green Yellower
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres		1  Poor — Cellulose and acetate— <i>u</i>	1  Poor — Cellulose and acetate— <i>u</i>
<b>DYEING: OTHER FIBRES</b>		Silk: neutral or acetic acid	Nylon: Silk: neutral or acetic acid
<b>PRINTING</b>		Direct on wool, silk and nylon	Direct on wool, silk, nylon and viscose
<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool		ISO  4-5 5 5 — 5  5 6 (yellower, duller) 6 (yellower, duller)  4-5 4-5 4 4  4-5 3 4-5 (pH 8.0) 5 1-2  4 (yellower) 5 4 (weaker, bluer) 3-4 (ISO 3) 4-5	ISO  4-5 5 5 — 5  5-6 6 (yellower, duller) 6-7 (yellower, duller)  4-5 4-5 4 4-5  4-5 4 4-5 (bluer) 5 1  5 5 4 (weaker, bluer) 3-4 (weaker, bluer) (ISO 3) 4-5
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron		Poor 4-5 (duller) 4-5 (yellower) 4-5 (yellower)	Poor 4-5 (yellower) 2 (yellower) 4-5 (yellower)
<b>NON-TEXTILE USAGE</b>	See Leather Dyes section		See Leather Dyes section
<b>NOTES</b>			<b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—yellowish green



29	30	31	C.I. Acid Green
— —	— —	— —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Green —	Bluish green —	Dull bluish green Duller	HUE Daylight Artificial light (tungsten)
2  Moderate — Cellulose and acetate—u	2  Moderate — Cellulose and acetate—u	1, 2  Moderate (acid), good (neutral) — —	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Silk: acetic acid	Silk: acetic acid	Silk: neutral or acetic acid	DYEING: OTHER FIBRES
Direct on wool and silk and dischargeable grounds on silk	Direct on wool and silk and dischargeable grounds on silk	Direct on wool and silk	PRINTING
ISO Wool      Silk —      — —      — —      — —      — —      —  3      3 4      3-4 5      5  —      — —      — —      — —      —  2-3      2-3 —      — —      —  —      — —      — 4      4 3      3 —      —	ISO Wool      Silk —      — —      — —      — —      — —      —  2      2-3 3      3 4      3-4  —      — —      — —      — —      —  3      3 5      — —      —  —      — —      — 4      4 3      3 —      —	ISO  4-5 4-5 — — 4-5  3 4 4-5  3-4 — — —  — — — 4-5 — — —  4 — 4-5 4-5 —	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Good — — —	Good — — —	Good Little change Unchanged Little change	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
			NON-TEXTILE USAGE
			NOTES

**C.I. Acid Green 32—37**

<b>C.I. Acid Green</b>	<b>32</b>	<b>33</b>	<b>34</b>
<b>CHEMICAL CLASS</b>	Azo (metallised)	Trisazo	Disazo
<b>C.I. CONSTITUTION NUMBER</b>	—	33545	27520
<b>HUE</b> Daylight Artificial light (tungsten)	Dull green —	Dull bluish green Little change	Dull bluish green —
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	3  Good — —	2  Moderate — Cellulose and acetate— <i>hs</i>	1, 2  Moderate — Silk and cellulose— <i>hs</i> , acetate— <i>ss</i>
<b>DYEING: OTHER FIBRES</b>		Silk: neutral or acetic acid	
<b>PRINTING</b>	Direct on wool and silk		
<b>FASTNESS PROPERTIES</b> Method	ISO	ISO	ISO
Alkali	4-5	4-5	3-4
Carbonising	4	4-5	4
Chlorination — alteration	—	—	3
staining wool	—	—	—
Decatising	5	4	3
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	6	—	—
normal	6-7	3-4	2
2 × normal	7	4	—
Milling, alkaline — alteration	4-5	3-4	4
staining wool	—	—	3-4
Milling, acid — alteration	—	—	—
staining wool	—	—	—
Peroxide bleaching — alteration	—	—	—
staining wool	—	—	—
Perspiration	4-5	4-5	4-5
Potting — alteration	3-4	—	—
staining wool	—	—	—
Sea water — alteration	5	4-5	5
staining wool	—	—	—
Stoving	4-5	4-5	4-5
Washing — alteration	4-5	4	5
staining wool	—	—	5
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Good Duller Unchanged Little change	Good Slightly duller Unchanged Little duller	Moderate — — —
<b>NON-TEXTILE USAGE</b>	Leather: on vegetable, chrome and semi-chrome tannages		
<b>NOTES</b>			

35	36	37	C.I. Acid Green
Monoazo (metallised) 13361	Anthraquinone 61595	Anthraquinone 62515	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Dull bluish green Duller	Dull green Slightly duller	Bright bluish green Slightly yellowish	HUE Daylight Artificial light (tungsten)
3  Moderate to good — Cellulose and acetate—u	2  Moderate — Cellulose—ss, acetate—u	1, 2  Good — Cellulose—ss, acetate—u	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: formic or sulphuric acid Silk: broken degumming liquor	Silk: broken degumming liquor or neutral	Silk: broken degumming liquor	DYEING: OTHER FIBRES
Direct on wool and silk		Direct on wool and silk	PRINTING
AATCC                  ISO	ISO	ISO	FASTNESS PROPERTIES Method
4 5 — 5	4-5 4-5 3-4 4	4-5 5 — 4-5	Alkali Carbonising Chlorination — alteration staining wool Decatising
5 5-6 6	5 5-6 6	6 6 6-7	Light, $\frac{1}{8}$ - $\frac{1}{2}$ normal normal 2 × normal
3 — — —	4 — 4 —	4 4-5 5 —	Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool W
— — 5 — —	1-2 — 4-5 3-4	— — 5 —	Peroxide bleaching — alteration staining wool
5 — 5 4-5 4-5	4-5 — 4-5 4 5	4-5 5 5 4 4-5	Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Moderate Much duller Unchanged Weaker and duller	Poor Duller Unchanged Duller	Moderate Little change Unchanged Little change	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
See Leather Dyes section			NON-TEXTILE USAGE
			NOTES

**C.I. Acid Green 38—43**

<b>C.I. Acid Green</b>	<b>38</b>	<b>39</b>	<b>40</b>
<b>CHEMICAL CLASS</b>	Anthraquinone	—	Anthraquinone
<b>C.I. CONSTITUTION NUMBER</b>	62550	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Green Slightly duller	Dark bluish green —	Bluish green Brighter
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	2  Moderate — Silk—s, cellulose and acetate —u		1, 2  — IV/1 Cellulose and acetate—u
<b>DYEING: OTHER FIBRES</b>			Nylon: neutral or acetic acid Silk: acetic acid
<b>PRINTING</b>			Direct on wool, silk and viscose
<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool	ISO  4-5 5 — 5  6 6 6-7  2-3 4 4 —  2-3 — 4 —  4 4-5 5 3 4-5		AATCC      ISO  5              5 4-5          3 3-4          4 3-4          5 4-5          4  5              6 5              6 5-6          6-7  4              3 4              5 —             3-4 —             1  —              3 —              2 4-5          4 —              2 —              2  5              4-5 5              5 5              3-4 4-5          3-4 4-5          4
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Poor Duller Unchanged Duller		Poor Slight change Unchanged Slightly duller
<b>NON-TEXTILE USAGE</b>		Leather: vegetable, chrome and semi-chrome tannages. Shoe-upper and suède leathers. Brush-staining. On chrome tannage (ISO): Light 1, Penetration 4	See Leather Dyes section
<b>NOTES</b>			<b>Reactions in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—blue



41	42	43	C.I. Acid Green
Anthraquinone 62560	Anthraquinone 62575	Monoazo (1 : 2 metal complex) —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Green Slightly yellower	Dull green Little change	Dull green Somewhat yellower	HUE Daylight Artificial light (tungsten)
2  Moderate — Cellulose and acetate— <i>u</i>	1, 2  Moderate — Cellulose and acetate— <i>u</i>	1  Poor; initial strike level — Acetate— <i>s</i> , cellulose— <i>ss</i>	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Silk: broken degumming liquor	Silk: broken degumming liquor or neutral	Nylon: neutral Silk: neutral or weakly acid	DYEING: OTHER FIBRES
Direct on wool and silk	Direct on wool and silk	Direct on wool, silk, nylon and viscose Vigoureux printing	PRINTING
AATCC                  ISO	ISO	ISO	FASTNESS PROPERTIES Method
4 4-5 — 4-5 — 5-6 — 3-4 — — — — 3-4 — — 3-4 — 5 3-4 3-4	4-5 5 — 4-5 — 6-7 6-7 7 3 — 5 — 2-3 4 — — 4-5 4 — 5 5 3 4	5 4-5 3-4 5 5 5-6 6-7 7 4 5 4 4-5 3 5 5 3 2-3 5 5 5 5 5	Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ – $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Moderate Duller Unchanged Duller and weaker	Moderate Somewhat yellower and duller Unchanged Somewhat yellower and duller	Moderate Little duller Unchanged Little duller	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
Paper Pigments		See Leather Dyes section	NON-TEXTILE USAGE
			NOTES

**C.I. Acid Green 44—49**

<b>C.I. Acid Green</b>	<b>44</b>	<b>45</b>	<b>46</b>
<b>CHEMICAL CLASS</b>	Anthraquinone	Monoazo (metallised)	—
<b>C.I. CONSTITUTION NUMBER</b>	61590	13420	—
<b>HUE</b> Daylight Artificial light (tungsten)	Bluish green Little change	Green Yellower and duller	Bright yellowish green Bluer
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	1, 2  Moderate — Cellulose—ss, acetate—u	3  Good; can be salted at boil — Cellulose and acetate—ss	
<b>DYEING: OTHER FIBRES</b>	Silk: neutral or broken degumming liquor	Nylon: formic or sulphuric acid Silk: broken degumming liquor	Nylon: ammoniacal (wool —hs; silk, acetate and cel- lulose—ss)
<b>PRINTING</b>	Direct on wool and silk	Direct on wool and silk, or as dischargeable ground	Direct on nylon
<b>FASTNESS PROPERTIES</b> Method	ISO	AATCC	ISO (on Perlon)
Alkali	4-5	5	4
Carbonising	5	5	3
Chlorination — alteration	—	—	3
staining wool	—	—	3
Decatising	5	5	4
Light, $\frac{1}{2}$ — normal	6	5	5
normal	6	5-6	5-6
2 × normal	6-7	6	5-6
Milling, alkaline — alteration	4	4	4-5
staining wool	4-5	4	5
Milling, acid — alteration	5	—	3-4
staining wool	—	—	—
Peroxide bleaching — alteration	4	—	1-2
staining wool	—	—	—
Perspiration	5	5	3-4
Potting — alteration	—	—	2-3
staining wool	—	—	—
Sea water — alteration	4-5	5	3
staining wool	4	—	—
Stoving	5	5	3-4
Washing — alteration	4-5	4	4
staining wool	4-5	4	3-4
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Moderate Duller Unchanged Duller	Good Duller Little change Duller	Good to very good Much change — Unchanged
<b>NON-TEXTILE USAGE</b>		See Leather Dyes section	
<b>NOTES</b>			

47	48	49	C.I. Acid Green
— —	Polyazo —	Azo (metallised) —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Dark green —	Bluish green —	Dark green	HUE Daylight Artificial light (tungsten)
			DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Silk			DYEING: OTHER FIBRES
			PRINTING
			FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{8}$ – $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
			OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
See Leather Dyes section	See Leather Dyes section	See Leather Dyes section	NON-TEXTILE USAGE
	Reactions in substance H <sub>2</sub> SO <sub>4</sub> conc.—dark green		NOTES

# C.I. Acid Green 50—54

C.I. Acid Green	50	50:1	51
CHEMICAL CLASS	Triphenylmethane	Triphenylmethane	Azo (metal complex)
C.I. CONSTITUTION NUMBER	44090	—	—
HUE Daylight Artificial light (tungsten)	Bluish green Slightly yellower	Bluish green Slightly yellower	Olive Unchanged
DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres	3  — I/3 Nylon— <i>hs</i> , cellulose and acetate— <i>u</i>	Chemically slightly different from C.I. Acid Green 50, but properties and uses very similar except for increased fastness to heat	1, 2  Initial strike level — Acetate— <i>ss</i> , cellulose— <i>s</i>
DYEING: OTHER FIBRES	Silk: sulphuric acid		Nylon: alkaline Silk: acetic acid
PRINTING	Direct on wool and silk		
FASTNESS PROPERTIES Method	AATCC	ISO	ISO
Alkali	1	2	4
Carbonising	4	2	5
Chlorination — alteration	3	3-4	—
staining wool	3	4	—
Decatising	4	4	5
Light, $\frac{1}{2}$ normal	—	2	5-6
normal	2-3	3	5-6
2 × normal	—	4	7
Milling, alkaline — alteration	2	1	5
staining wool	2	1	4-5
Milling, acid — alteration	—	3	4
staining wool	—	1	5
Peroxide bleaching — alteration	1	1	—
staining wool	1	5	—
Perspiration	2	4	5
Potting — alteration	1	1	3-4
staining wool	1	1	2-3
Sea water — alteration	3	3	5
staining wool	3	1	5
Stoving	4	3-4	5
Washing — alteration	3	2	4-5
staining wool	3	3	5
OTHER PROPERTIES			
Dischargeability	Poor		—
Effect of metals — copper	Unchanged		Yellower
chromium	—		—
iron	Much duller and weaker		Slightly yellower
NON-TEXTILE USAGE	Biological stain Paper coating and surface colouring See C.I. Food Green 4 See Leather Dyes section Wood stain		
NOTES			



52	53	54	C.I. Acid Green
Azo (metal complex) —	—	Anthraquinone —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Dull green Brighter	Green —	Bright green Yellower, brighter	HUE Daylight Artificial light (tungsten)
1, 2  Initial strike level — Acetate and cellulose— <i>u</i>		1, 2  Good; can be salted at boil — Acetate and cotton— <i>u</i>	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: slightly alkaline Silk: acetic acid		Nylon and silk: neutral or weakly acid	DYEING: OTHER FIBRES
		Direct on wool, nylon and silk	PRINTING
ISO  5 5 — — 5  5-6 6 6-7  4-5 5 4-5 5  — — 5 3-4 2-3  5 5 4-5 5 5		ISO  4 5 4-5 — 5  5-6 6 6-7  4-5 5 4-5 5  4 4 5 3-4 3  5 5 5 4-5 5	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{8}$ – $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
— Little yellower — Unaffected		2 5 Unchanged 4	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
	See Leather Dyes section		NON-TEXTILE USAGE
			NOTES

C.I. Acid Green	55	56	57
CHEMICAL CLASS	Monoazo	Monoazo (1:2 metal complex)	Monoazo (1:2 metal complex)
C.I. CONSTITUTION NUMBER	—	—	—
HUE Daylight Artificial light (tungsten)	Yellowish green —	Olive —	Bright yellowish green Yellower, brighter
DYEING: WOOL Method	1, 2	1, 2	1, 2
Levelling S.D.C. migration test method/grade Staining other fibres	Moderate — Acetate and cellulose— <i>ss</i>	Good; can be salted at boil — Acetate and cellulose— <i>ss</i>	Good; can be salted at boil — Acetate and cotton— <i>u</i>
DYEING: OTHER FIBRES	Silk: neutral or weakly acid	Silk: neutral or weakly acid	Acrylic Nylon and silk: neutral or weakly acid
PRINTING			Direct on wool, silk and nylon
FASTNESS PROPERTIES Method	ISO	ISO Wool      Silk	ISO *Wool
Alkali	4-5	5	4
Carbonising	4-5	4-5	4-5
Chlorination — alteration	3	5	3-4
staining wool	5	—	—
Decatising	4-5	4-5	5
Light, $\frac{1}{2}$ normal	4-5	6	6
normal	4-5	6-7	6-7
2 × normal	5	6-7	7
Milling, alkaline — alteration	4	4-5	4-5
staining wool	5	5	5
Milling, acid — alteration	4	5	2
staining wool	5	5	2
Peroxide bleaching — alteration	—	5	4
staining wool	—	5	4
Perspiration	4-5	5	5
Potting — alteration	—	2	3
staining wool	—	1	2-3
Sea water — alteration	4	5	5
staining wool	5	5	5
Stoving	4-5	5	5
Washing — alteration	3-4	5	4-5
staining wool	4-5	5	5
OTHER PROPERTIES			
Dischargeability	2	2	3-4
Effect of metals — copper	4-5	—	5
chromium	Unchanged	Unchanged	Somewhat yellower, duller
iron	4-5	—	4
NON-TEXTILE USAGE		Leather	See Leather Dyes section Wooled sheepskins
NOTES			*Fastness on silk: Alkali 6; Light 6 (normal); Perspiration, Sea water and Washing 4 Fastness on nylon: Light 7 (normal); Alkaline milling, Perspiration and Washing 5 Fastness on acrylic: Light 6 (normal); Alkaline milling and Washing 3; Perspiration 4

58	59	60	C.I. Acid Green	
Monoazo (1 : 2 metal complex) —	Anthraquinone —	Monoazo (1 : 2 metal complex) —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER	
Dull green Unchanged	Bright green Yellower, brighter	Olive —	HUE Daylight Artificial light (tungsten)	
1, 2  Good; can be salted at boil — Acetate and cotton—ss	1, 2  Good; can be salted at boil — Acetate and cotton—u	1, 2  Poor* — Acetate—s, cotton—ss, viscose—u	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres	
Nylon and silk: neutral or weakly alkaline	Nylon and silk: neutral or weakly acid	Nylon and silk: ammonium acetate or sulphate	DYEING: OTHER FIBRES	
Direct on wool and silk	Direct on wool, silk and nylon		PRINTING	
ISO *Wool 4 4 2-3 — 5  6-7 7 7-8  4-5 5 3-4 3-4  4 4-5 4-5 4-5 3-4  5 5 — 5 5	ISO *Wool 4 4-5 3 — 4  6 6-7 7  4 5 4-5 5  4 4-5 4 4 4  4 5 4 4 5	AATCC  — — — — —  5 5-6 6  — — — —  — — — —  — — — —  — — — — —	ISO  5 5 4 — 5  6 6-7 7  4-5 5 — —  — — — —  — — — —  5 5 5 4-5 5	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration 

**C.I. Acid Green 61—65:1**

<b>C.I. Acid Green</b>	<b>61</b>	<b>62</b>	<b>63</b>
<b>CHEMICAL CLASS</b>	Azo (metal complex)	Monoazo (1:2 metal complex)	Formazan (metal complex)
<b>C.I. CONSTITUTION NUMBER</b>	—	11836	—
<b>HUE</b> Daylight Artificial light (tungsten)	Olive green —	Brownish olive —	Green Yellower
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres		1, 2  Poor; initial strike level — Acetate— <i>vss</i> , cellulose— <i>ss</i>	1, 2  — — —
<b>DYEING: OTHER FIBRES</b>		Nylon: neutral Silk: as for wool	Nylon: ammonium sulphate and sodium phosphate
<b>PRINTING</b>		Direct on wool, silk and nylon Vigoureux printing	Direct on wool, silk and nylon
<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool		ISO  5 4-5 5 5 5  5-6 6 6-7  5 5 5 5  4-5 5 5 — —  — — 4-5 5 4-5 4-5	ISO  4-5 4-5 4-5 4-5 4  6 7 7-8  3-4 4-5 3-4 4-5  4 5 4-5 4 3  3-4 5 — 4-5 3-4
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron		Good 4 Unaffected 5	3-4 4 — 4
<b>NON-TEXTILE USAGE</b>		See Leather Dyes section	See Leather Dyes section
<b>NOTES</b>			





### C.I. Acid Green 66—72

C.I. Acid Green	66	67 & 68	69
CHEMICAL CLASS	Monoazo	Azo	Anthraquinone
C.I. CONSTITUTION NUMBER	—	—	—
HUE Daylight Artificial light (tungsten)	Olive Unchanged		Green Yellower
DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres	1, 2  Good; can be salted at boil — Acetate, acrylic, cellulose and polyester—ss		1  Good — Acetate and acrylic—u, cotton— s, polyester—hs
DYEING: OTHER FIBRES	Nylon: trisodium phosphate, a levelling agent and acetic acid		Nylon: trisodium phosphate and ammonium sulphate
PRINTING	Direct on wool, silk and nylon		Direct on wool, silk and nylon
FASTNESS PROPERTIES Method	ISO		Wool      ISO      Nylon Silk
Alkali	4 (yellower)		4      3 (yellower)      4
Carbonising	4-5		4-5      —      5
Chlorination — alteration	4-5		3 (yellower)      —      —
staining wool	4-5		—      —      —
Decatising	4-5		4-5      —      4-5
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	5-6		5-6      4-5      6
normal	6		6-7      5      6-7
2 × normal	6		7      5-6      7-8
Milling, alkaline — alteration	4		5      —      4-5
staining wool	4-5		5      —      5
Milling, acid — alteration	4		4-5      —      —
staining wool	3		5      —      —
Peroxide bleaching — alteration	3-4 (yellower)		—      —      —
staining wool	4		—      —      —
Perspiration	5		5      3-4      4-5
Potting — alteration	3		4      —      1
staining wool	2		1-2      —      4
Sea water — alteration	5		3-4      3 (yellower)      4
staining wool	5		5      4-5      4
Stoving	4 (yellower)		—      —      —
Washing — alteration	4-5		4-5      3      4-5
staining wool	4-5		5      4-5      5
OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron	2 4 (yellower, duller) Unchanged 4-5		2 5 Yellower 5
NON-TEXTILE USAGE		See Leather Dyes sec- tion	Wooled sheepskins
NOTES	Reactions in substance H <sub>2</sub> SO <sub>4</sub> conc.—olive; on dil- ution—dull brown Aq soln + HCl no change; + NaOH—weaker		Reactions in substance H <sub>2</sub> SO <sub>4</sub> conc.—greyish blue; on dilution—greenish blue

70	71	72	C.I. Acid Green
Monoazo —	Anthraquinone —	Monoazo (1 : 2 metal complex) —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Bluish green Yellower	Bright green (wool)*	Dull bluish green Yellower	HUE Daylight Artificial light (tungsten)
2  Poor; initial strike level — Acetate and cellulose— ss, silk—hs	—  Moderate—good — Acetate and cellulose—u	2  Fair — Acetate, acrylic, cellulose and polyester—u	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: neutral or weakly alkaline Silk: neutral or weakly acid bath	Silk: Nylon: acetic acid (medium —deep dyeings) or ammon- ium sulphate (pale dyeings)	Nylon and silk: weak acid	DYEING: OTHER FIBRES
Wool, silk, nylon			PRINTING
AATCC — — 1 — —  — — —  — — — — — 1 — —  — — — — —	ISO 5 4-5 3-4(bluer) 5  6-7 7 7-8  4-5 5 5 5  5 5 5 4-5 5 5 5 5	ISO 4 5 — — 5  5-6 6 6-7  5 5 —  4-5 5 —  5 5 4 4-5 4-5	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, 1/2 — 1/2 normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Poor, 3 Slight change — Slight change	5 (wool), 2 (silk, nylon) — —	Not dischargeable 3 — 3	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
See Leather Dyes section	See Leather Dyes section		NON-TEXTILE USAGE
Solubility in water: good	*Brighter yellower green (nylon)		NOTES

# C.I. Acid Green 73—78

C.I. Acid Green	73	74	75
CHEMICAL CLASS	Monoazo (1:2 metal complex)	Monoazo (1:2 metal complex)	Azo (metallised)
C.I. CONSTITUTION NUMBER	—	—	—
HUE Daylight Artificial light (tungsten)	Greenish olive —	Yellowish green Yellower	Olive Yellower
DYEING: WOOL Method	1, 2	1	1, 2
Levelling	—	Good; can be salted at boil	—
S.D.C. migration test method/grade	—	—	—
Staining other fibres	Acetate, acrylic, cellulose and polyester—u, modacrylic—s	Acetate, acrylic and cellulose—ss	—
DYEING: OTHER FIBRES	Nylon and silk: neutral or weak acid	Silk: acetic acid bath	Nylon Silk
PRINTING		Wool and silk	Direct on wool, silk and nylon Vigoureux printing
FASTNESS PROPERTIES Method	ISO	ISO	ISO
Alkali	4-5	5	4-5
Carbonising	5	2-3 (bluer)	—
Chlorination — alteration	5	4-5	—
staining wool	5	5	—
Decatising	4-5	3 (bluer)	4-5
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal	5	5-6	4-5
normal	6	6	5
2 × normal	7	6-7	—
Milling, alkaline — alteration	5	4-5	—
staining wool	5	5	—
Milling, acid — alteration	5	2-3 (bluer)	—
staining wool	5	3-4	—
Peroxide bleaching — alteration	4-5	2	3-4
staining wool	5	5	3
Perspiration	5	5	4-5
Potting — alteration	4-5	4 (bluer)	4-5
staining wool	2-3	1	2-3
Sea water — alteration	—	5	4-5
staining wool	—	5	4-5
Stoving	4-5	3-4 (bluer)	—
Washing — alteration	4-5	4 (bluer)	4-5
staining wool	4-5	5	5
OTHER PROPERTIES			
Dischargeability	Poor	2-3	2-3
Effect of metals — copper	—	—	—
chromium	—	Little effect	Little effect
iron	—	—	—
NON-TEXTILE USAGE	See Leather Dyes section	See Leather Dyes section	
NOTES	Reactions in substance H <sub>2</sub> SO <sub>4</sub> conc. — greenish blue; on dilution—yellowish brown Aq soln + HCl—brownish olive; + NaOH—yellowish brown	Reactions in substance H <sub>2</sub> SO <sub>4</sub> conc.—navy; on dilution—bordeaux red Aq soln + HCl—green; + NaOH—green (bluer)	





**C.I. Acid Green 79—84**

<b>C.I. Acid Green</b>	<b>79</b>	<b>80</b>	<b>81</b>
<b>CHEMICAL CLASS</b>	Azo (metallised)	Monoazo (1:2 metal complex)	Anthraquinone
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Olive Brighter	Green Yellower	Bright green —
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	1, 2  Moderate — Cellulose— <i>ss</i> , acetate— <i>ss-s</i> , acrylic— <i>hs-d</i>		2  Good — —
<b>DYEING: OTHER FIBRES</b>	Nylon: neutral Silk: neutral or weakly acid	Nylon: heavy dyeings obtained by the high-temp. process. Reserve polyester—cotton 3, 4-5	Nylon: weak acid Silk: neutral or weak acid
<b>PRINTING</b>	Direct on wool, silk and nylon		
<b>FASTNESS PROPERTIES</b> Method	ISO	ISO	ISO
Alkali	5	—	4 (yellower)*
Carbonising	—	—	4-5
Chlorination — alteration	—	—	4
staining wool	—	—	4-5
Decatising	—	5	4
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	—	6-7	6
normal	6	7	6-7
2 × normal	—	7	7
Milling, alkaline — alteration	4-5	—	3-4
staining wool	5	—	4
Milling, acid — alteration	—	—	4 (yellower)
staining wool	—	—	4-5
Peroxide bleaching — alteration	5	—	4
staining wool	3-4	—	3
Perspiration	4-5	5	4-5
Potting — alteration	4-5	—	3-4
staining wool	2	—	3
Sea water — alteration	4-5	5	4-5
staining wool	4-5	5	5
Stoving	—	—	5
Washing — alteration	4-5	5	3-4
staining wool	5	5	4-5
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Dischargeable to white Unaffected — Slightly affected	3 (wool), 4 (nylon), 2 (silk) — — —	Not dischargeable to white 3-4 3-4 (yellower) 4
<b>NON-TEXTILE USAGE</b>		See Leather Dyes section	
<b>NOTES</b>	Solubility 90 g/l at 80°C	Solubility 100 g/l	*Fastness on silk: Light 5, 5-6, 6; Perspiration 4-5; Stoving 4-5; Washing 4, 4-5 Fastness on nylon: Light 5-6, 6, 6; Alk. milling 4, 4-5; Perspiration 4; Sea water 4, 4; Washing 4, 4-5

82	83	84	C.I. Acid Green
Monoazo (metal complex) —	Azo-anthraquinone —	Anthraquinone —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Yellowish green —	Green Duller	Bluish green Yellower	HUE Daylight Artificial light (tungsten)
		1, 2  — — —	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
	Nylon	Silk : neutral or slightly acid	DYEING: OTHER FIBRES
			PRINTING
	ISO  5 3-4 5 5 4-5  6-7* 6-7 6-7  4 5 — —  5 5 4 2 3  4 5 4 2 4	ISO  4(yellower) 4-5 4(bluer) 4-5 4  6 6-7 6-7  3-4 4 4-5 5  3-4 3 4-5 3-4 2  4-5 5 4-5 4-5 5	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ - $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
		Moderate 4 4-5 4	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
Anodised aluminium Fastness: Light 7-8; Weather—very good			NON-TEXTILE USAGE
	*1/25 × normal	Fastness on silk: Light 5, 5, 5-6; Perspiration 3-4; Stoving 4; Washing 3-4, 4	NOTES

**C.I. Acid Green 85—90**

<b>C.I. Acid Green</b>	<b>85</b>	<b>86</b>	<b>87</b>
<b>CHEMICAL CLASS</b>	Monoazo (1:2 metal complex)	Monoazo (1:2 metal complex)	Azo (metal complex)
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Green Yellower	Olive Yellower	Dull green Duller
<b>DYEING: WOOL</b> Method	1	1	1, 2
Levelling S.D.C. migration test method/grade Staining other fibres	— — Acrylic and cellulose—s	— — Acetate, acrylic, cellulose and polyester—ss	Good — Acetate, acrylic, cellulose and polyester—ss
<b>DYEING: OTHER FIBRES</b>	Nylon Silk: neutral or slightly acid	Nylon Silk: neutral	Nylon: $\text{Na}_3\text{PO}_4$ — $(\text{NH}_4)_2\text{SO}_4$ Silk: neutral or weak acid
<b>PRINTING</b>			
<b>FASTNESS PROPERTIES</b> Method	ISO	ISO	ISO
Alkali	4	4	4
Carbonising	4-5	4-5	4
Chlorination — alteration	4	4-5	2
staining wool	5	4-5	—
Decatising	4	4-5	4-5
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	5-6	6	5-6
normal	6	6-7	6
2 × normal	5-6	7	6-7
Milling, alkaline — alteration	4	4	4-5
staining wool	4-5	4-5	4
Milling, acid — alteration	4	4	3-4
staining wool	3-4	3-4	4-5
Peroxide bleaching — alteration	4	4-5	—
staining wool	4	4	—
Perspiration	5	5	5
Potting — alteration	2	2-3	3-4
staining wool	2	2	2-3
Sea water — alteration	5	5	5
staining wool	5	5	5
Stoving	4	4	—
Washing — alteration	4	4	4
staining wool	4-5	4-5	4-5
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	2-3 4 4-5 4	1 4-5 4-5 4-5	Fair (wool, nylon), poor (silk) 4-5 Yellower 4
<b>NON-TEXTILE USAGE</b>			
<b>NOTES</b>	Fastness on silk: Light 5, 5-6, 6; Perspiration 4-5; Stoving 4-5; Washing 4, 4 Fastness on nylon: Light 5-6, 6, 7; Alk milling 4, 2-3; Perspiration 5; Sea water 5, 4; Washing 4-5, 3	Fastness on silk: Light 5-6, 6, 6-7; Perspiration 4-5; Stoving 4-5; Washing 3, 4 Fastness on nylon: Light 5-6, 6, 6-7; Alk milling 4-5, 3-4; Perspiration 5; Sea water 5, 4-5; Washing 3, 4-5	Fastness on silk: Alkali 4-5; Light 5-6, 5-6, 7; Perspiration 5; Sea water 4-5, 4; Washing 3-4, 4-5 Fastness on nylon: Carbonising 3-4; Decatising 5; Light 5, 6-7, 7; Perspiration 5; Potting 2, 1; Sea water 5, 5; Washing 5, 3-4



88	89	90	C.I. Acid Green
Nitroso (metal complex)	Monoazo (1:2 metal complex)	Nitroso	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Green Yellower	Dull green Yellower	— —	HUE Daylight Artificial light (tungsten)
— Moderate — —	— Poor — Acrylic, cellulose, polyester and triacetate—s	2 Good — —	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Basified acrylics Nylon Silk	Acrylic Nylon Silk	Silk: neutral or acetic acid	DYEING: OTHER FIBRES
Direct on wool and nylon	Direct on wool, nylon and acrylic	Direct on wool, silk and viscose	PRINTING
ISO  — 4 4-5 — 4-5  5-6 6 —  4 4 4 4-5  4-5 4 5 — —  5 5 5 4 4-5	ISO  — 4 2-3 — 4-5  5-6 6 —  4-5 4-5 4-5 4-5  5 5 5 — —  5 5 — 4-5 4-5	ISO  3-4 4 4-5 — 4-5  5 5-6 6  4 4-5 4 4-5  4-5 4 5 — —  5 5 1 4 4-5	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Moderate — — —	Poor to moderate — — —	3 (wool), 4 (silk) 4-5 2 (yellower) 4-5	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
			NON-TEXTILE USAGE
		Fastness on silk: Light 4- 5, 5, 6; Perspiration 4; Peroxide bleaching 3-4, 3; Sea water 4, 3-4; Washing 4, 4	NOTES

**C.I. Acid Green 91—96**

<b>C.I. Acid Green</b>	<b>91</b>	<b>92</b>	<b>93</b>
<b>CHEMICAL CLASS</b>	Azo (1:2 metal complex)	Azo (1:2 metal complex)	Azo (metal complex)
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Green Yellower	Olive Yellower	Olive —
<b>DYEING: WOOL</b> Method	1	3-4	
Levelling	—	—	
S.D.C. migration test method/grade	—	—	
Staining other fibres	—	—	
<b>DYEING: OTHER FIBRES</b>		Nylon	
<b>PRINTING</b>	Vigoureux printing		
<b>FASTNESS PROPERTIES</b> Method	ISO	ISO	
Alkali	4	—	
Carbonising	4	4-5	
Chlorination — alteration	4-5	4-5	
staining wool	—	4-5	
Decatising	4-5	4-5	
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal	5-6	6	
normal	6	6	
2 × normal	6-7	6-7	
Milling, alkaline — alteration	4-5	4	
staining wool	4-5	4-5	
Milling, acid — alteration	4	—	
staining wool	4	—	
Peroxide bleaching — alteration	4-5	—	
staining wool	4	—	
Perspiration	5	5	
Potting — alteration	2	2-3	
staining wool	2	2	
Sea water — alteration	5	—	
staining wool	5	—	
Stoving	5	—	
Washing — alteration	4	4	
staining wool	4-5	4	
<b>OTHER PROPERTIES</b> Dischargeability	2-3		
Effect of metals — copper	4-5		
chromium	4-5		
iron	4		
<b>NON-TEXTILE USAGE</b>			See Leather Dyes section
<b>NOTES</b>	Fastness on silk: Light 5, 5, 5-6; Perspiration 4; Stoving 4-5; Washing 3-4, 4 Fastness on nylon: Light 6-7, 7, 7; Alk milling 4, 3; Perspiration 4-5; Sea water 4-5, 3-4; Washing 4-5, 4	Fastness on nylon: Light 5-6, 6-7, 7; Alk milling 4-5, 4-5; Perspiration 5; Sea water 5, 5; Washing 4-5, 4-5	

94	95	96	C.I. Acid Green
Disazo —	Anthraquinone —	Monoazo (1:2 metal complex) —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Dull olive brown —	Bluish green Yellower	Dull green Yellower	HUE Daylight Artificial light (tungsten)
	1, 2  Moderate — Acetate and cellulose—ss		DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
	Nylon: acetic acid	Nylon	DYEING: OTHER FIBRES
	Direct on wool and nylon	Direct on nylon, acrylic, tri- acetate and wool	PRINTING
	ISO  — — — —  6-7* —  — — — —  4* — —  — — 4-5* 5*	ISO  — 4-5 — — 5  6 —  4 5 4-5 5  — — 5 — —  5 — 5 —	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
			OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
Anodised aluminium Fastness: Light 6; Heat fair; Weather poor			NON-TEXTILE USAGE
	*nylon 6·6		NOTES

# C.I. Acid Green 97

<b>C.I. Acid Green</b>	<b>97</b>	
<b>CHEMICAL CLASS</b>	Phthalocyanine	
<b>C.I. CONSTITUTION NUMBER</b>	—	
<b>HUE</b> Daylight Artificial light (tungsten)	Green —	
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres		
<b>DYEING: OTHER FIBRES</b>		
<b>PRINTING</b>		
<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool		
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron		
<b>NON-TEXTILE USAGE</b>		
<b>NOTES</b>	See Leather Dyes section	



C.I. Acid Brown	1	2	3		
CHEMICAL CLASS	Nitro	Monoazo	Monoazo		
C.I. CONSTITUTION NUMBER	10395	17605	14610		
HUE Daylight Artificial light (tungsten)	Brown Slightly redder and brighter	Brown Redder	Brown Somewhat yellower		
DYEING: WOOL Method	3	2, 3	3		
Levelling S.D.C. migration test method/grade Staining other fibres	Good — Acetate and cellulose— <i>u</i>	— I/2 Acetate and cellulose— <i>vss</i>	Good — Acetate and cellulose— <i>ss</i>		
DYEING: OTHER FIBRES	Nylon: formic acid Silk: acetic acid + Glauber's salt	Silk: neutral or acetic acid, or broken degumming liquor	Silk: broken degumming liquor		
PRINTING		Direct on silk and wool	Direct on wool		
FASTNESS PROPERTIES Method	AATCC	ISO	AATCC	ISO	ISO
Alkali	4	3	2	3	3
Carbonising	3	3	4-5	3-4	3
Chlorination — alteration	—	—	3	3	—
staining wool	—	—	3	5	—
Decatising	4	4	4	4	3
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal	3	4	5	5	1-2
normal	3	4-5	5-6	5-6	2
2 × normal	4	4-5	6	6	2-3
Milling, alkaline — alteration	1	2	2	1	1-2
staining wool	—	—	2	1	—
Milling, acid — alteration	—	—	—	4	—
staining wool	—	—	—	2	—
Peroxide bleaching — alteration	1	1	—	1	1
staining wool	—	—	—	1	—
Perspiration	2-3	3	4-5	4	2
Potting — alteration	—	—	—	1	1
staining wool	—	—	—	1	—
Sea water — alteration	2-3	2-3	4	4-5	2
staining wool	—	—	4	4-5	—
Stoving	4	4	4-5	3-4	2
Washing — alteration	1	2	3	3	2
staining wool	1	3-4	3	3	2-3
OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron	Poor Unaffected — Slightly redder		Moderate Redder Little change Yellower		Moderate to poor Slightly redder — Little duller
NON-TEXTILE USAGE	Pencil leads (as shading component) See Leather Dyes section	Casein buttons			See Leather Dyes section
NOTES					On silk the fastness to water and washing may be improved by aftertreatment with tannin and tartar emetic

# C.I. Acid Brown 4—8

C.I. Acid Brown	4	5	6
<b>CHEMICAL CLASS</b>	Monoazo	Disazo	Monoazo
<b>C.I. CONSTITUTION NUMBER</b>	14805	20095	14625
<b>HUE</b> Daylight Artificial light (tungsten)	Reddish brown Little change	Reddish brown Duller	Reddish brown Little yellower
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	3  Good — Acetate—s, cellulose—u	3  — — Acetate and cellulose—ss	3  Good — Acetate and cellulose—ss
<b>DYEING: OTHER FIBRES</b>		Silk: acid	Silk: broken degumming liquor
<b>PRINTING</b>	Direct on silk and wool		
<b>FASTNESS PROPERTIES</b> Method	ISO	ISO	ISO
Alkali	2-3	2-3	1
Carbonising	3	5	3
Chlorination — alteration	—	—	—
staining wool	—	—	—
Decatising	4	—	4
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal	2	—	2
normal	3	2	2
2 × normal	3	—	3
Milling, alkaline — alteration	1-2	2	1-2
staining wool	—	1-2	—
Milling, acid — alteration	1	—	—
staining wool	—	—	—
Peroxide bleaching — alteration	3	—	2
staining wool	—	—	—
Perspiration	2	1-2	1
Potting — alteration	—	—	1
staining wool	—	—	—
Sea water — alteration	1-2	—	2
staining wool	—	—	—
Stoving	2	—	1
Washing — alteration	3-4	2-3	2-3
staining wool	2	3	1-2
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Good, but white not permanent Little duller — Much weaker		Moderate to good Slightly duller — Duller
<b>NON-TEXTILE USAGE</b>	Casein, paper, soap and wood stains	Paper	Biological stain See Leather Dyes section
<b>NOTES</b>			

7	7:1	8	C.I. Acid Brown
Monoazo —	— —	Monoazo 13000	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Reddish brown Redder and brighter		Brown Little change	HUE Daylight Artificial light (tungsten)
2, 3 — I/2-3 Acetate and cellulose—ss	Similar to C.I. Acid Brown 7 in properties and usage	1, 2 or 3  Good — Acetate and cellulose—ss	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: formic or sulphuric acid Silk: broken degumming liquor, or weak acid			DYEING: OTHER FIBRES
Direct on silk and wool		Direct on silk and wool	PRINTING
AATCC                  ISO  2                          3 5                          4-5 —                          3-4 —                          3-4 5                          4  2                          2-3 3                          3-4 4                          4-5  3                          3 3                          3 —                          4 —                          4  —                          1 —                          3 1                          3 —                          1 —                          1  3                          4 3                          4 2-3                        4 3                          2-3 3                          4		ISO  3 4 — — 4  4-5 4-5 5  1 — 3 —  1 — 3 — —  3 — 2-3 3 2	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2× normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Moderate Duller — Duller		Poor Little redder and duller Little change Somewhat duller and weaker	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
Paper See Leather Dyes section		See Leather Dyes section	NON-TEXTILE USAGE
			NOTES

# C.I. Acid Brown 9—14

C.I. Acid Brown	9	10	11
<b>CHEMICAL CLASS</b>	Monoazo	—	—
<b>C.I. CONSTITUTION NUMBER</b>	17165	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Brown Slightly redder	Yellowish brown Little change	Brown Little redder
<b>DYEING: WOOL</b> Method	3	3	3
Levelling S.D.C. migration test method/grade Staining other fibres	Good — Acetate—s, cellulose—u	Good — Acetate and cellulose—u	— I/3-4 Acetate and cellulose—u
<b>DYEING: OTHER FIBRES</b>			
<b>PRINTING</b>	Wool: discharge printing		Direct on nylon and wool
<b>FASTNESS PROPERTIES</b> Method	ISO	AATCC	ISO
Alkali	4	—	4-5
Carbonising	4	4-5	4-5
Chlorination — alteration	—	—	4-5
staining wool	—	—	2
Decatising	4	5	5
Light, $\frac{1}{8}$ — $\frac{1}{2}$ normal	3	—	6-7
normal	4	6-7	7
2 × normal	4	—	7
Milling, alkaline — alteration	2-3	—	—
staining wool	2-3	—	—
Milling, acid — alteration	—	—	3
staining wool	—	—	—
Peroxide bleaching — alteration	1	—	4
staining wool	—	—	—
Perspiration	2-3	3	4-5
Potting — alteration	—	—	2
staining wool	—	—	—
Sea water — alteration	2-3	4	4
staining wool	—	—	2
Stoving	4	—	5
Washing — alteration	3	4	4
staining wool	4	4	5
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Good — — —	— — Little change —	Moderate Little duller Little change Little duller
<b>NON-TEXTILE USAGE</b>		See Leather Dyes section	
<b>NOTES</b>			



12	13	14	C.I. Acid Brown		
Monoazo —	Nitro 10410	Disazo 20195	CHEMICAL CLASS C.I. CONSTITUTION NUMBER		
Reddish brown Redder	Brown Brighter and redder	Reddish brown Redder and brighter	HUE Daylight Artificial light (tungsten)		
3  Good; may be salted at boil — Acetate and cellulose—ss	2  Poor — Acetate and cellulose—u	2  Moderate — Acetate and cellulose—vss	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres		
Silk: acetic acid	Nylon: acetic acid Silk: acetic acid or neutral	Nylon: acetic or formic acid Silk: acetic acid or neutral	DYEING: OTHER FIBRES		
Direct on silk and wool Ground discharge styles		Direct on silk and wool	PRINTING		
ISO 3-4 5 3 — 5  2 3 4-5  3 — 2-3 —  3 — 3-4 2-3 —  5 — 4-5 4 —	AATCC 4 4 — — —  — 6-7 —  3-4 — — —  4 — 4-5 — —  4 — 4-5 3 —	ISO 4 4-5 — — —  — 6-7 —  5 — 4-5 — —  4 — 4-5 2-3 —  4-5 4-5 4 —	AATCC 2 5 — — —  3 4 4  1-2 — — —  1-2 — 1 — —  4 — 1 3 3	ISO 3 3-4 2 — 4  2 3 4  2 — — —  3 — 4 — —  4 — 3 3 4-5	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{8}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Good Bluer and duller — Duller	Moderate Redder and duller — Much redder and duller	Moderate Little duller Little change Yellower and duller	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron		
		Paper, shoe cream emul- sions, wood stains See Leather Dyes section	NON-TEXTILE USAGE		
			NOTES		

# C.I. Acid Brown 15—19:1

C.I. Acid Brown	15	16	17
CHEMICAL CLASS	Disazo	Monoazo	Disazo
C.I. CONSTITUTION NUMBER	20190	17610	20111
HUE Daylight Artificial light (tungsten)	Reddish brown —	Brown Somewhat redder	Brown Yellower
DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres	Similar to C.I. Acid Brown 14 in properties and usage	2  Moderate — Acetate and cellulose—ss	2  Moderate — Acetate—hs, cellulose—ss
DYEING: OTHER FIBRES		Silk: neutral with Glauber's salt, or broken degumming liquor	Silk: acetic or formic acid
PRINTING		Direct on wool	
FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool		ISO  3 4-5 — — 4  4 4 4-5  3 — 3 —  2 — 3 —  3 — 3-4 3-4 3	ISO  3-4 3 — — 4-5  3 4 4  2-3 2 3 3  2 2 3 —  3-4 3-4 2 3 3-4
OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron		Moderate Somewhat yellower, weaker Little change Yellower and weaker	Poor Distinct change — Distinct change
NON-TEXTILE USAGE			
NOTES			

<b>18</b>	<b>19</b>	<b>19:1</b>	<b>C.I. Acid Brown</b>
Azo —	— —	— —	<b>CHEMICAL CLASS</b> <b>C.I. CONSTITUTION NUMBER</b>
Brown Little change	Reddish brown Little change		<b>HUE</b> Daylight Artificial light (tungsten)
1, 2	1, 2 Migration poor; initial strike level — Acetate—ss, cellulose—vss	Similar in hue, properties and usage to C.I. Acid Brown 19 but slightly different chemically	<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres
Silk: neutral or weakly alkaline soap bath containing Glauber's salt Levelling: moderate	Nylon: neutral Silk: neutral or weakly acid (level dyeing)		<b>DYEING: OTHER FIBRES</b>
	Direct on nylon, silk, viscose and wool Vigoureux printing		<b>PRINTING</b>
Silk Good — — — —  — 3-4 —  — — — —  Fairly good — —  — — Fairly good Fairly good —	ISO  5 5 5 5 5  6 6-7 7  5 5 5 5  5 5 5 2-3 2-3  5 5 4-5 5 5		<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ - $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
	Poor Unaffected Little change Some change		<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron
	See Leather Dyes section		<b>NON-TEXTILE USAGE</b>
	Unaffected by formaldehyde. Can be used with metachrome dyes		<b>NOTES</b>

**C.I. Acid Brown 20—25**

<b>C.I. Acid Brown</b>	<b>20</b>	<b>21</b>	<b>22</b>
<b>CHEMICAL CLASS</b>	Monoazo	—	Azo
<b>C.I. CONSTITUTION NUMBER</b>	17640	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Dull brown Little redder	Reddish brown Little change	Brown Redder
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	1, 2  Moderate — Acetate and cellulose—ss	1, 2  Migration poor; initial strike level — Acetate and cellulose—ss	2  Moderate — Acetate and cellulose—ss
<b>DYEING: OTHER FIBRES</b>	Silk: broken degumming liquor	Nylon: neutral Silk: neutral or weakly acid; level dyeing	Silk: neutral or acetic acid
<b>PRINTING</b>	Direct on silk and wool	Direct on nylon, silk, viscose and wool Vigoureux printing	
<b>FASTNESS PROPERTIES</b> Method	ISO	ISO	AATCC      ISO
Alkali	3-4	5	4-5      4-5
Carbonising	4	5	4      4-5
Chlorination — alteration	—	5	—      4
staining wool	—	5	—      —
Decatising	4-5	5	—      4-5
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	4	6	3      3
normal	4	6-7	4      3-4
2 × normal	4-5	7	4      4-5
Milling, alkaline — alteration	3	5	3      4-5
staining wool	—	5	—      —
Milling, acid — alteration	2-3	5	—      —
staining wool	—	5	—      —
Peroxide bleaching — alteration	2-3	5	2      —
staining wool	—	5	—      —
Perspiration	3	5	4-5      5
Potting — alteration	—	2-3	—      —
staining wool	—	2-3	—      —
Sea water — alteration	4	4-5	3      5
staining wool	—	4-5	—      —
Stoving	4	5	4-5      5
Washing — alteration	3	5	3      5
staining wool	3-4	5	—      —
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Poor Little change — Little change	Moderate Unaffected Little change Little change	Poor Yellower Little change Yellower
<b>NON-TEXTILE USAGE</b>		See Leather Dyes section	Feathers, straw
<b>NOTES</b>		Unaffected by formaldehyde Can be used with metachrome dyes	<b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—reddish blue



23	24	25	C.I. Acid Brown
Monoazo —	Disazo —	Anthraquinone —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Brown Little change	Bright reddish brown Unchanged	Brown Slightly redder and brighter	HUE Daylight Artificial light (tungsten)
2 Moderate — Acetate and cellulose— <i>ss</i>	1, 2 Moderate — Cellulose— <i>s</i>	2 Poor — Acetate and cellulose— <i>hs</i>	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: acetic or formic acid Silk: acetic acid			DYEING: OTHER FIBRES
Direct on wool			PRINTING
ISO 4 4-5 — — 4-5 3 4 4-5 3 — — 4 — — 4-5 — 5 4-5 —	ISO 3 — — — — — 4 — — 3 2 — — — — 5 1 3 4 — 5 3 2	AATCC 4 4-5 — — — — — 7-8 — — 3 — — — — — 3 — — 4 — — 2 —	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Poor Somewhat duller — Somewhat duller		— Slightly duller — Appreciably duller	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
	See Leather Dyes section		NON-TEXTILE USAGE
Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—red		Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—bluish black soln; on diln—brown ppt.	NOTES

**C.I. Acid Brown 26—29**

<b>C.I. Acid Brown</b>	<b>26</b>	<b>27</b>
<b>CHEMICAL CLASS</b>	Anthraquinone	Anthraquinone
<b>C.I. CONSTITUTION NUMBER</b>	65000	66710
<b>HUE</b> Daylight Artificial light (tungsten)	Brown Unchanged	Brown Redder
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	2  Moderate* — Acetate and cellulose—u	1, 2  Better neutral than acid IV/1-2 Acetate and cellulose—ss
<b>DYEING: OTHER FIBRES</b>		Silk: acetic acid or neutral
<b>PRINTING</b>	Direct on wool	Direct on silk and wool
<b>FASTNESS PROPERTIES</b> Method	ISO	AATCC      ISO
Alkali	4	4      4
Carbonising	4-5	5      4-5
Chlorination — alteration	—	5      4
staining wool	—	5      4
Decatising	4-5	5      5
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	5-6	5      5-6
normal	6	6      6-7
2 × normal	6-7	7      7
Milling, alkaline — alteration	4	3-4      4-5
staining wool	—	3-4      4
Milling, acid — alteration	4	—      3-4
staining wool	—	—      3-4
Peroxide bleaching — alteration	2-3	—      3
staining wool	—	—      3
Perspiration	3-4	4-5      5
Potting — alteration	—	—      3
staining wool	—	—      2
Sea water — alteration	4	4-5      4-5
staining wool	—	4-5      4-5
Stoving	3-4	5      4-5
Washing — alteration	4-5	4-5      5
staining wool	4-5	4-5      5
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Moderate to poor Little weaker Little change Much weaker	Poor Little change Little change Little change
<b>NON-TEXTILE USAGE</b>		
<b>NOTES</b>	*Unsuitable for salting at boil	

28	29	C.I. Acid Brown
— —	Monoazo (metallised) 12197	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Reddish brown Brighter, redder	Reddish brown Redder	HUE Daylight Artificial light (tungsten)
1, 2 Migration poor; initial strike level — Acetate— <i>ss</i> , cellulose— <i>vss</i>	1, 2 Poor — Acetate— <i>hs</i> , cellulose— <i>u</i>	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: Glauber's salt + ammonium sulphate or acetate, often with a retarding agent Silk: Glauber's salt + ammonium sulphate or acetate, or in broken degumming liquor	Nylon: ammonium acetate	DYEING: OTHER FIBRES
Direct on nylon, silk, viscose and wool Vigoureux printing	Direct on nylon and wool	PRINTING
ISO Wool      Nylon 5          5 5          5 4          4-5 —         — 4          4-5  6          6 7          7 7-8       7-8  5          5 5          4-5 3          — 2-3       —  4          — 4-5       — 4-5       5 2-3       — —         —  5          5 —         — 4-5       5 5          5 5          5	AATCC Wool      Nylon 1          — —         — —         — —         — —         —  5          5 5-6       6 6          7  3-4       4-5 —         — —         — —         —  —          5 —         — 5          5 —         — —         —  4-5       4-5 —         — —         — 3-4       4 (II) —         —	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool  Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool  Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool  Perspiration Potting — alteration staining wool  Sea water — alteration staining wool  Stoving Washing — alteration staining wool
Moderate to good Little change Little change Little yellow	Moderate (on nylon) Redder — Little redder	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
See Leather Dyes section	See Leather Dyes section	NON-TEXTILE USAGE
Unaffected by formaldehyde. Can be used with metachrome dyes	Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—dull reddish violet	NOTES

### C.I. Acid Brown 30—34

<b>C.I. Acid Brown</b>	<b>30</b>	<b>31</b>
<b>CHEMICAL CLASS</b>	—	Monoazo (metallised)
<b>C.I. CONSTITUTION NUMBER</b>	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Bordeaux Yellower	Reddish brown Brighter
<b>DYEING: WOOL</b> Method	1, 2	1, 2
Levelling S.D.C. migration test method/grade Staining other fibres	Migration poor; initial strike level — Acetate and cotton— <i>ss</i> , viscose— <i>u</i>	Good Acetate— <i>hs</i> , cellulose— <i>ss</i>
<b>DYEING: OTHER FIBRES</b>	Nylon: Glauber's salt + ammonium sulphate or acetate, often with a retarding agent Silk: Glauber's salt + ammonium sulphate or acetate, or in broken degumming liquor	Nylon: neutral or acetic acid Silk: acetic acid + Glauber's salt
<b>PRINTING</b>	Direct on nylon, silk, viscose and wool Vigoureux printing	
<b>FASTNESS PROPERTIES</b> Method	ISO	AATCC
	Wool      Nylon	
Alkali	5	4-5
Carbonising	5	3
Chlorination — alteration	4-5	—
staining wool	—	—
Decatising	4-5	4-5
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	6-7	7
normal	7	7
2 × normal	7-8	7-8
Milling, alkaline — alteration	4-5	3-4
staining wool	4	—
Milling, acid — alteration	—	—
staining wool	—	—
Peroxide bleaching — alteration	—	2-3
staining wool	—	—
Perspiration	4-5	4-5
Potting — alteration	—	—
staining wool	—	—
Sea water — alteration	5	4
staining wool	—	—
Stoving	4-5	3
Washing — alteration	4	3-4
staining wool	3-4	—
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Moderate to good — — —	Good Unchanged — Considerably changed
<b>NON-TEXTILE USAGE</b>	See Leather Dyes section	
<b>NOTES</b>	Unaffected by formaldehyde. Can be used with metachrome dyes	<b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—dull yellow



32	33	34	C.I. Acid Brown
Disazo 23000	Azo (metallised) —	— —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Reddish brown —	Reddish brown Somewhat redder	Brown Somewhat yellower	HUE Daylight Artificial light (tungsten)
	1, 2  Good — —	2  Moderate — Acetate and cellulose—ss	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
	Nylon: ammonium acetate +levelling agent Silk: acetic acid or neutral	Silk: broken degumming liquor	DYEING: OTHER FIBRES
Direct on wool	Direct on nylon, silk and wool Vigoureux printing	Direct on silk and wool	PRINTING
ISO  — — — — —  — 3-4 —  — — — —  — — — — — 4 — — 4 —	ISO  5 5 4-5 4-5 5  6 7 7-8  4-5 4-5 3 2  4-5 3 5 2 1-2  5 5 4-5 5 4-5	ISO  3-4 3-4 — — 3-4  4-5 5 6  3 — —  4 — 3-4 3 —  4 — 3 3-4 3-4	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
	Good — Little change —	Poor Somewhat duller — Duller	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
		Leather	NON-TEXTILE USAGE
		On silk wet fastness proper- ties are improved by after- treatment with tannin and tartar emetic	NOTES

# C.I. Acid Brown 35—39

C.I. Acid Brown	35	36
<b>CHEMICAL CLASS</b>	Monoazo	Anthraquinone
<b>C.I. CONSTITUTION NUMBER</b>	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Brown Little change	Brown —
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	2  Moderate — Acetate and cellulose—ss	2  Heavy dyeings: mod. Medium dyeings: poor — Acetate—u, cellulose—ss
<b>DYEING: OTHER FIBRES</b>	Nylon: acetic or formic acid Silk: acetic acid	Silk: acetic acid or neutral
<b>PRINTING</b>	Direct on silk	Direct on silk and wool (light prints)
<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool	ISO  4-5 4-5 — — 5  3 4 4-5  3-4 — — —  — — 4-5 — —  4-5 — 5 4-5 —	AATCC  1-2 5 — — —  6 7 8  1 — — —  4 — 4 5 —  4-5 — 5 3 —
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Poor Little change Little change Little change	Poor Slightly duller — Much duller
<b>NON-TEXTILE USAGE</b>	Fur	
<b>NOTES</b>	<b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—violet	<b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—greenish blue

<b>37</b>	<b>38</b>	<b>39</b>	<b>C.I. Acid Brown</b>
— —	Monoazo —	— —	<b>CHEMICAL CLASS</b> <b>C.I. CONSTITUTION NUMBER</b>
Brown —	Reddish brown Somewhat redder	Dull brown Little change	<b>HUE</b> Daylight Artificial light (tungsten)
	2  Moderate Acetate—s, cellulose—ss	2  Moderate Acetate—vss, cellulose—hs	<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres
	Nylon; acetic acid	Silk: acetic acid or broken degumming liquor	<b>DYEING: OTHER FIBRES</b>
	Direct on wool		<b>PRINTING</b>
	AATCC                  ISO	ISO	<b>FASTNESS PROPERTIES</b> Method Alkali Carbonising Chlorination — alteration staining wool Decatising Light, $\frac{1}{2}$ – $\frac{1}{2}$ normal normal 2 × normal Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool Sea water — alteration staining wool Stoving Washing — alteration staining wool
	5                  5 3                  5 —                 — —                 — 4                  1  —                  4 4                  4–5 —                  5  3                  — —                  — —                  3 —                  3  —                  — —                  — 3                  3 —                  — —                  —  4                  — —                  — 2                  4 4                  3–4 4                  5	4* 4 — — 5  4 4 4–5  3–4 3–4 — —  — — — 4 — — 4 4 4 4	
	Poor Somewhat duller — Much bluer	Poor — Little change —	<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron
See Leather Dyes section	See Leather Dyes section	See Leather Dyes section	<b>NON-TEXTILE USAGE</b>
<b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—brownish olive		*On silk fastness to light is 3–4; perspiration 2; other fastness properties as on wool	<b>NOTES</b>

**C.I. Acid Brown 40—45**

<b>C.I. Acid Brown</b>	<b>40</b>	<b>41</b>	<b>42</b>
<b>CHEMICAL CLASS</b>	Trisazo	Disazo	Monoazo (metallised)
<b>C.I. CONSTITUTION NUMBER</b>	—	—	<b>14251</b>
<b>HUE</b> Daylight Artificial light (tungsten)	Brown —	Reddish brown Much redder and brighter	Reddish brown Somewhat redder
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres		2  Poor — Acetate—u, cellulose—ss	3  Good — Acetate and cellulose—ss
<b>DYEING: OTHER FIBRES</b>		Nylon: acetic or formic acid or neutral Silk: acetic acid or neutral (main use)	Silk: broken degumming liquor
<b>PRINTING</b>		Direct on silk and wool	Direct on silk and wool
<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool		AATCC  3 3 — — —  — 3 —  1 — — —  4  5 — —  4-5 — 4 3 —	AATCC      ISO  1      3 4      4 —      4 —      — —      4  6      5-6 6-7      6 7      6-7  3      3-4 3      4 —      4 —      —  —      2 —      — 5      4 —      3 —      —  3      3-4 —      — —      4 3      4 3      3
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron		Moderate Little change — Much redder	Good Duller Little change Weaker
<b>NON-TEXTILE USAGE</b>	See Leather Dyes section	See Leather Dyes section	See Leather Dyes section
<b>NOTES</b>		<b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—purple	On silk the wet fastness prop- erties are improved by after- treatment with tannin and tartar emetic



43	44	45	C.I. Acid Brown	
Disazo 20300	— —	— —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER	
Yellowish brown —	Brown Yellower	Brown Somewhat yellower	HUE Daylight Artificial light (tungsten)	
Acid bath	1, 2  Migration poor; initial strike level — Acetate— <i>u</i> , cellulose— <i>vss</i>	1, 2  Migration poor; initial strike level — Acetate and cellulose— <i>vss</i>	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres	
	Nylon: neutral or slightly alkaline Silk: neutral or weakly acid; level dyeing	Nylon: neutral or slightly alkaline Silk: neutral or weakly acid; level dyeing	DYEING: OTHER FIBRES	
	Direct on nylon, silk, viscose and wool Vigoureux printing	Direct on nylon, silk, viscose and wool Vigoureux printing	PRINTING	
	ISO  4 5 4-5 — 5  6 6 6-7  4-5 5 4 3-4  4-5 — 4-5 4 2-3  5 5 4-5 4-5 5	AATCC  — 4  — —  — 6 —  — — — —  — — 5 — —  — — 5 5 5	ISO  4 4 5 — 4-5  6 6-7 6-7  5 5 4 —  5 — 5 3-4 —  5 5 5 5 5	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ – $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
	Good Unchanged Little change Slightly duller	Good Unchanged Little change Slightly duller	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron	
See Leather Dyes sec- tion			NON-TEXTILE USAGE	
Main use is for leather Has moderate fastness properties on wool	Unaffected by formaldehyde	Fastness on nylon (AATCC): Light 5, Perspiration 4, Sea Water 5, Washing (70°C.) 4-5	NOTES	

**C.I. Acid Brown 46—50**

<b>C.I. Acid Brown</b>	<b>46</b>	<b>47</b>
<b>CHEMICAL CLASS</b>	—	—
<b>C.I. CONSTITUTION NUMBER</b>	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Brown Somewhat yellower	Reddish brown Yellower
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	1, 2  Migration poor; initial strike level — Acetate— <i>u</i> , cellulose— <i>vss</i>	1, 2  Migration poor; initial strike level — Acetate and cotton— <i>ss</i> , viscose— <i>u</i>
<b>DYEING: OTHER FIBRES</b>	Nylon: neutral or slightly alkaline Silk: neutral or weakly acid; level dyeing	Nylon: neutral or slightly alkaline Silk: neutral or weakly acid; level dyeing
<b>PRINTING</b>	Direct on nylon, silk, viscose and wool Vigoureux printing	Direct on nylon, silk, viscose and wool Vigoureux printing
<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool	ISO  4 4 4–5 — 5  5–6 6 6–7  4–5 5 4 3–4  4–5 — 4–5 4 3–4 2–3  5 5 5 5 5	ISO  4 4 3–4 — 5  6 6–7 7  4–5 4–5 — 4–5  — — 5 — 1–2  5 5 4 4 4
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Good Unchanged Little change Slightly duller	Good Unaffected Little change Slightly duller
<b>NON-TEXTILE USAGE</b>		
<b>NOTES</b>	Unaffected by formaldehyde	Unaffected by formaldehyde

48	49	50	C.I. Acid Brown
— —	— —	— —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Reddish brown Yellower	Brown Slightly redder	Reddish brown Redder	HUE Daylight Artificial light (tungsten)
1, 2 Migration poor* — Acetate and viscose—ss, cotton—s	1, 2 Poor; unsuitable for salting — Acetate and cellulose—u		DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: neutral or slightly alkaline Silk: neutral or weakly acid; level dyeing	Silk: neutral + Glauber's salt, or weak acid (the latter method giving greater colour value)	Nylon (main use): ammonia + levelling agent; ammon- ium sulphate added for ex- haustion. Levelling: good Cellulose—ss	DYEING: OTHER FIBRES
Direct on nylon, silk, vis- cose and wool Vigoureux printing	Direct on silk, viscose and wool	Direct on nylon	PRINTING
ISO 4 4 3-4 — 4-5  5 5-6 6-7  4-5 4-5 — 3  — — 5 — 2  4-5 4-5 4 4 4	ISO 4-5 4 4 5 4  6 6-7 6-7  5 — — 3-4 5 4-5 3 2  3 5 3 4-5 5	ISO Nylon 6 5 4-5 5 — 4-5  6-7 7 7-8  4-5 4-5 5 4-5  4 — 5 3-4 2-3  5 5 5 4-5 4-5	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Good Unaffected Little change Unaffected	Poor Trace duller Little change Little yellower	Moderate Slightly changed — Unchanged	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
	Paper Salts as pigments		NON-TEXTILE USAGE
Unaffected by formalde- hyde  *Initial strike level			NOTES

# C.I. Acid Brown 51—144

C.I. Acid Brown	Chemical Class	C.I. Constitution No.	Hue	Usage*	Reactions in substance H <sub>2</sub> SO <sub>4</sub> conc.	C.I. Acid Brown	Chemical Class	C.I. Constitution No.	Hue	Usage*	Reactions in substance H <sub>2</sub> SO <sub>4</sub> conc.
51	Monoazo	—	Brown	Leather	Reddish brown	74	Disazo	—	Brown	Leather	—
52	—	—	—	Leather	—	75	Polyazo	34905	Dull reddish brown	Leather	—
53	Azo	—	Dull reddish brown	Leather	—	76	Trisazo	—	Dull brown	Leather	—
54	Trisazo	—	Dull reddish brown	Leather	Brown	77	Disazo	—	Dull yellowish brown	Leather	—
55	Disazo	—	Dull reddish brown	Leather	Brown	78	Trisazo	—	Dull reddish brown	Leather	Greenish blue
56	Nitro	—	Dull yellowish brown	Leather	Brown	79	Disazo	—	Dull reddish brown	Leather	—
57	Polyazo	—	Dull reddish brown	Leather	Brown	80	Disazo	—	Brown	Leather	—
58	—	—	—	Leather	—	81	This C.I. Generic Name is discontinued				
59	Azo	—	Brown	Leather	Dull orange	82	This C.I. Generic Name is discontinued				
60	—	—	Brown	Leather	—	83	Disazo (copper complex)	20250	Yellowish brown	Leather	Reddish brown
61	—	—	—	Leather	—	84	Disazo (copper complex)	20255	Reddish brown	Leather	Reddish brown
62	Disazo	—	Dull reddish brown	Leather	Purple	85	Polyazo	34900	Dark brown	Leather	—
63	Disazo	—	Dull reddish brown	Leather	Dull violet	86	Monoazo (copper complex)	17620	Dark brown	Leather	Reddish violet
64	Trisazo	—	Dull brown	Leather	Olive	87	Monoazo	17596	Reddish brown	Leather	Cherry red
65	Disazo	—	Dull reddish orange	Leather	Violet	88	Monoazo	17595	Dull reddish brown	Leather	Red
66	Trisazo	—	Dull reddish brown	Leather	Reddish brown ppt.	89	Monoazo	17570	Dull brown	Leather	Violet
67	—	—	Dull reddish brown	Leather	—	90	Monoazo	17100	Reddish brown	Leather	Red
68	—	—	Reddish brown	Leather	—	91	Monoazo	17550	Dull brown	Leather	Dull reddish orange
69	Polyazo	—	Reddish brown	Leather	Black	92	Polyazo	36020	Dark brown	Leather	Dark grey
70	Disazo	—	Brown	Leather	Reddish brown	93	—	—	Dull brown	Leather	Bluish violet
71	Monoazo	—	Brown	Leather	Reddish brown	94	—	—	Dull brown	Leather	Bluish violet
72	Trisazo	—	Brown	Leather	Reddish brown	95	—	— <sup>1</sup>	Dull reddish brown	Leather	Bluish violet
73	Disazo	—	Dull reddish brown	Leather	—	96	Azo (metallised)	— <sup>2</sup>	Dull brown	Leather	Red
						97	Azo (metallised)	— <sup>3</sup>	Reddish brown	Leather	Red



C.I. Acid Brown	Chemical Class	C.I. Constitution No.	Hue	Usage*	Reactions in substance H <sub>2</sub> SO <sub>4</sub> conc.	C.I. Acid Brown	Chemical Class	C.I. Constitution No.	Hue	Usage*	Reactions in substance H <sub>2</sub> SO <sub>4</sub> conc.
98	Azo (metallised)	— <sup>4</sup>	Yellowish brown	Leather	Orange	120	Tetra-kisazo	35020	Reddish brown	Leather	—
99	—	—	Reddish brown	Leather	—	121	Trisazo	33520	Dull yellowish brown	Leather	—
100	—	—	Dull reddish brown	Leather	—	122	Trisazo	33525	Dull reddish brown	Leather	—
101	—	—	Reddish brown	Leather	—	123	Tetra-kisazo	35030	Yellowish brown	Leather	—
102	Monoazo	14615	Brown	Leather Wool	—	124	This C.I. Generic Name is discontinued. The dyes formerly listed under it are now listed under C.I. Acid Brown 78				
103	Amino-ketone (Nitro)	10415	Dull yellowish brown	Leather	—	125	Disazo	—	Reddish brown	Leather	Purple
104	—	—	Reddish brown	Leather	—	126	—	—	Dark brown	Leather	—
105	Trisazo	33530	Dull reddish brown	Leather Wool	—	127	Polyazo	—	Brown	Leather	Violet
106	—	—	Yellowish brown	Leather	—	128	—	—	Yellowish brown	Leather	—
107	—	—	Brownish grey	Leather Silk	—	129	Azo	—	Dull reddish brown	Leather	Bluish black
108	Trisazo	—	Dull brown	Leather Silk	Reddish brown	130	—	—	Brown	Leather	—
109	—	—	Brown	Leather	—	131	—	—	Dull reddish brown	Leather	—
110	Polyazo	—	Reddish brown	Leather	Reddish brown	132	—	—	Reddish brown	Leather	—
111	—	—	Dull bordeaux	Leather Silk	—	133	—	—	Brown	Leather	—
112	Trisazo	—	Dull yellowish brown	Leather Silk	Reddish brown	134	—	—	Brown	Leather	—
113	Polyazo	—	Dull brown	Leather Silk	Dull reddish brown	135	—	—	Brown	Leather	—
113:1	Tetra-kisazo	—	Greenish brown	Leather	—	136	—	—	Dull brown	Leather	—
	Made from the same components as C.I. Acid Brown 113 but the couplings are performed in a different order					137	—	—	Brown	Leather	—
114	—	—	Reddish brown	Leather Silk	—	138	—	—	Yellowish brown	Leather	—
115	Trisazo	—	Dull reddish brown	Leather Silk	Violet brown	139	—	—	Violet brown	Leather	—
116	Polyazo	—	Dull reddish brown	Leather	—	140	—	—	Violet brown	Leather	—
117	—	—	Dull bordeaux	Leather Silk	—	141	—	—	Dull brown	Leather	—
118	—	—	Dull reddish brown	Leather Silk	—	142	—	—	Violet brown	Leather	—
119	Tetra-kisazo	35025	Brown	Leather	—	143	Disazo (chromium complex)	20260	Dull reddish brown	Leather	—
						144	Monoazo (chromium complex)	14295	Bright yellowish brown	Leather	—

\*For details of usage on leather see Leather Dyes section <sup>4</sup>USP 2120799

# C.I. Acid Brown 145—216

C.I. Acid Brown	Chemical Class	C.I. Constitution No.	Hue	Usage*	Reactions in substance H <sub>2</sub> SO <sub>4</sub> conc.	C.I. Acid Brown	Chemical Class	C.I. Constitution No.	Hue	Usage*	Reactions in substance H <sub>2</sub> SO <sub>4</sub> conc.
145	Monoazo (chromium complex)	13280	Brown	Leather	—	174	—	—	Dull brown	Leather	—
146	Disazo (chromium complex)	26531	Bordeaux	Leather	—	175	—	—	Brown	Leather	—
147	—	—	Reddish brown	Leather	—	176	—	—	Brown	Leather	—
148	—	—	Dull brown	Leather	—	177	—	—	Brown →reddish brown	Leather	—
149	—	—	Brown	Leather	—	178	—	—	Brown	Leather	—
150	—	—	Dull brown	Leather	—	179	Trisazo	—	Dull brown	Leather	—
151	—	—	Dull reddish brown	Leather	—	180	—	—	Brown	Leather	—
152	Disazo	—	Reddish brown	Leather	Reddish brown	181	—	—	Brown	Leather	—
153	Disazo	—	Yellowish brown	Leather	Dull brown	182	—	—	Brown	Leather	—
154	Disazo	—	Yellowish brown	Leather	Reddish orange	183	—	—	Brown	Leather	—
155	Disazo	—	Brown	Leather	Dull orange	184	Trisazo	—	Reddish brown	Leather	—
156	Disazo	—	Brown	Leather	Violet	185	Trisazo	—	Reddish brown	Leather	—
157	Disazo	—	Brown	Leather	Olive brown	186	—	—	Reddish brown	Leather	—
158	Disazo	—	Orange brown	Leather	Reddish brown	187	—	—	Violet brown	Leather	—
159	—	—	Brown	Leather	—	188	—	—	Yellowish brown	Leather	—
160	—	—	Brown	Leather	—	189	—	—	Reddish brown	Leather	—
161	—	—	Brown	Leather	—	190	—	—	Reddish brown	Leather	—
162	—	—	Brown	Leather	—	191	—	—	Reddish brown	Leather	—
163	—	—	Brown	Leather	—	192	This C.I. Generic Name is discontinued; the dyes formerly listed under it are now listed under C.I. Acid Brown 58				
164	—	—	Reddish brown	Leather	—	193	—	—	Reddish brown	Leather	—
165	—	—	Brown	Leather	—	194	—	—	Violet brown	Leather	—
166	—	—	Reddish brown	Leather	—	195	—	—	Yellowish brown	Leather	—
167	—	—	Dull brown	Leather	—	196	—	—	Reddish brown	Leather	—
168	—	—	Brown	Leather	—	197	Disazo	—	Brown	Leather	Bluish red
169	—	—	Brown	Leather	—	198	Disazo	—	Dull brown	Leather	Yellowish brown
170	—	—	Brown	Leather	—	199	Disazo	—	Dull reddish brown	Leather	Greenish black
171	—	—	Brown	Leather	—	200	Disazo	—	Brown	Leather	Brown
172	—	—	Brown	Leather	—	201	Polyazo	—	Dull reddish brown	Leather	Bluish violet
173	—	—	Brown	Leather	—						

C.I. Acid Brown	Chemical Class	C.I. Constitution No.	Hue	Usage*	Reactions in substance H <sub>2</sub> SO <sub>4</sub> conc.
202	Disazo	—	Reddish brown	Leather	Brown
203	Monoazo	—	Brown	Leather	Brown
204	Disazo	—	Dull reddish brown	Leather	Brown
205	Disazo	—	Dull brown	Leather	Brown
206	Disazo	—	Brown	Leather	Brown
207	Trisazo	—	Dull reddish brown	Leather	Blue
208	Disazo	—	Dull brown	Leather	Black
209	Disazo	—	Brown	Leather	Reddish brown
210	—	—	Dark brown	Leather	—
211	Nitro	10425	Yellowish brown	Leather	—
212	Nitro	10380	Dull reddish brown	Leather	—
213	Disazo	20175	Brown	Leather	—
214	Trisazo	34907	Brown	Leather	—
215	Disazo	—	Dull brown	Leather	—
216	Trisazo (metal complex)	34906	Dull reddish brown	Leather	—

**C.I. Acid Brown 217—224**

<b>C.I. Acid Brown</b>	<b>217</b>	<b>218</b>	<b>219</b>
<b>CHEMICAL CLASS</b>	Azo (metal complex)	Azo (metal complex)	—
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Reddish brown Unchanged	Brown Yellower	Yellowish brown —
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	1, 2  Migration poor; initial strike level Acetate— <i>u</i> , cellulose— <i>ss</i>	1, 2  Migration poor; initial strike level Acetate— <i>vss</i> , cellulose— <i>s</i>	
<b>DYEING: OTHER FIBRES</b>	Nylon: slightly alkaline Silk: acetic acid	Nylon: slightly alkaline Silk: acetic acid	
<b>PRINTING</b>			
<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool	ISO  4-5 5 — — 5  6 6-7 7  5 5 4-5 3-4  — — 5 4-5 3  5 5 — 5 4-5	ISO  5 5 — — 5  5-6 6-7 7  4-5 5 4 4  — — 4-5 4-5 2-3  5 4-5 4 5 5	
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	— Slightly weaker — Unaffected	— Unaffected — Unaffected	
<b>NON-TEXTILE USAGE</b>			See Leather Dyes Section
<b>NOTES</b>			



220-222	223	224	C.I. Acid Brown
— —	Monoazo (1 : 2 metal complex) —	Monoazo (1 : 2 metal complex) —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Brown —	Yellowish brown —	Brown —	HUE Daylight Artificial light (tungsten)
	1, 2  Moderate — Acetate—s, cotton—vss, viscose—u	1, 2  Good; may be salted at boil — Acetate and cellulose—ss	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
	Acrylic and nylon: neutral Silk: neutral or slightly acid	Silk: neutral or weakly acid	DYEING: OTHER FIBRES
	Direct on nylon, silk and wool		PRINTING
	AATCC  5 4-5 2-3 — 4  5-6 5-6 6-7  4 4 — —  — — 4-5 — —  5 5 — 4-5 4-5	ISO  5* 5 5 — 4 (redder)  6 6-7 6-7  4-5 5 4 5  5 5 4-5 2-3 1  4-5 5 5 5 5	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{8}$ - $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
	Poor — — —	2 — Little change —	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
See Leather Dyes section		Leather	NON-TEXTILE USAGE
	Reactions in substance H <sub>2</sub> SO <sub>4</sub> conc.—yellow; on dilution—yellow Aq. soln.+HCl dilute—no change; +NaOH dilute—no change	*Fastness on silk (ISO): Light 5-6, 6, 6-7	NOTES

**C.I. Acid Brown 225—229**

<b>C.I. Acid Brown</b>	<b>225</b>	<b>226</b>	<b>226:1</b>
<b>CHEMICAL CLASS</b>	Monoazo (1:2 metal complex)	Monoazo (1:2 metal complex)	—
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Brown —	Reddish brown —	
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	1, 2  Good; may be salted at boil — Acetate and cellulose—ss	1, 2  Good; may be salted at boil — Acetate and cellulose—ss	Similar in hue, application and properties to C.I. Acid Brown 226, but slightly different chemically
<b>DYEING: OTHER FIBRES</b>	Silk: neutral or weakly acid	Nylon Silk: neutral or weakly acid	
<b>PRINTING</b>			
<b>FASTNESS PROPERTIES</b> Method	ISO	ISO	
Alkali	4-5*	4-5	
Carbonising	4-5	5	
Chlorination — alteration staining wool	3-4 (greener) —	4-5 —	
Decatising	4 (greener)	4-5	
Light, $\frac{1}{2}$ — $\frac{1}{4}$ normal	6	6-7	
normal	6-7	6-7	
2 × normal	6-7	7	
Milling, alkaline — alteration staining wool	4-5 4-5	5 5	
Milling, acid — alteration staining wool	4-5 3-4	4-5 3	
Peroxide bleaching — alteration staining wool	4-5 4-5	5 3-4	
Perspiration	4-5	5	
Potting — alteration staining wool	2-3 1	3-4 1	
Sea water — alteration staining wool	5 5	5 5	
Stoving	3-4	3 (greener)	
Washing — alteration staining wool	5 5	4-5 4-5	
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	3 — — —	3 — Little change —	
<b>NON-TEXTILE USAGE</b>	Leather	See Leather Dyes section	
<b>NOTES</b>	*Fastness on silk (ISO): Light 5, 5-6, 6	Fastness on silk (ISO): Light 5-6, 6, 6-7; Sea water 4 (3-4); Washing 3-4 (3-4)	



**C.I. Acid Brown 230—237**

<b>C.I. Acid Brown</b>	<b>230</b>	<b>231,232</b>	<b>233</b>
<b>CHEMICAL CLASS</b>	—	Azo (metal complex)	Monoazo (1 : 2 metal complex)
<b>C.I. CONSTITUTION NUMBER</b>	—	—	20018
<b>HUE</b> Daylight Artificial light (tungsten)			Reddish brown —
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	This C.I. Generic Name is discontinued		1, 2  Poor; initial strike level — Acetate— <i>vss</i> , cellulose— <i>ss</i>
<b>DYEING: OTHER FIBRES</b>			Nylon: neutral Silk: neutral or weakly acid (or acid-yielding ammonium salt)
<b>PRINTING</b>			Direct on nylon, silk and wool Vigoureux printing
<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool			ISO  5 5 4 4-5 4-5  5-6 6 6-7  4-5 4 5 5  4-5 4 5 — —  — —  1 4 4
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron			Fairly good 3 — 5
<b>NON-TEXTILE USAGE</b>			See Leather Dyes section
<b>NOTES</b>			Unaffected by formaldehyde



234	235	236,237	C.I. Acid Brown
Monoazo (1 : 2 metal complex) 11837	Polyazo —	Azo —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Dull brown —		Brown —	HUE Daylight Artificial light (tungsten)
1, 2  Poor; initial strike level — Acetate— <i>vss</i> , cellulose— <i>ss</i>			DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Silk: neutral or weakly acid (or acid-yielding ammonium salt)			DYEING: OTHER FIBRES
Direct on nylon, silk and wool Vigoureux printing			PRINTING
ISO  4-5 4 4-5 5 4-5  5 6 6-7  3 4 1 3  4-5 4-5 4-5 — —  — — 1 3 .4			FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ - $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Fairly good 3 — 2			OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
See Leather Dyes section	See Leather Dyes section	See Leather Dyes section	NON-TEXTILE USAGE
Unaffected by formaldehyde			NOTES

**C.I. Acid Brown 238—242**

<b>C.I. Acid Brown</b>	<b>238</b>	<b>239</b>	<b>240</b>
<b>CHEMICAL CLASS</b>	Stilbene	Trisazo	Monoazo (1:2 metal complex)
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Brown —	Dull brown —	Brown Yellower, brighter
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres			1, 2  — — —
<b>DYEING: OTHER FIBRES</b>			Nylon: ammonium sulphate + sodium phosphate Also for silk, jute and sisal
<b>PRINTING</b>			Direct on nylon, silk and wool
<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool			ISO  4-5 4-5 4-5 4-5 5  6 6-7 7  4-5 4-5 4 3  4-5 4 5 2 2-3  5 5 4 4-5 4-5
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron			4 3-4 — 4-5
<b>NON-TEXTILE USAGE</b>	See Leather Dyes section	See Leather Dyes section	See Leather Dyes section
<b>NOTES</b>			



**C.I. Acid Brown 243-247**

<b>C.I. Acid Brown</b>	<b>243</b>	<b>244</b>	<b>245</b>
<b>CHEMICAL CLASS</b>	Monoazo (1:2 metal complex)	Polyazo	Azo (1:2 metal complex)
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Reddish brown Slightly redder	Brown —	Brown Slightly greener
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	1, 2  Moderate — Cotton—ss, viscose—u		1, 2  Poor; initial strike level — Acetate—u, cellulose—ss
<b>DYEING: OTHER FIBRES</b>	Nylon and silk: Neutral or weakly acid Acrylic		Nylon: Weakly alkaline Silk: Acetic acid
<b>PRINTING</b>	Direct on nylon, silk and wool (urea method)		
<b>FASTNESS PROPERTIES</b> Method	AATCC		ISO Wool    ISO Nylon    ISO Silk
Alkali	—		4-5    4-5    5
Carbonising	4-5		5    —    —
Chlorination — alteration	—		5    —    —
staining wool	—		—    —    —
Decatising	4		4-5    —    —
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal	4-5		5    5    4-5
normal	5		5-6    6    5
2 × normal	6		6-7    6-7    6
Milling, alkaline — alteration	4		4-5    —    —
staining wool	3		5    —    —
Milling, acid — alteration	—		4    —    —
staining wool	—		2-3    —    —
Peroxide bleaching — alteration	—		—    —    —
staining wool	—		—    —    —
Perspiration	5		5    5    4
Potting — alteration	—		2-3    —    —
staining wool	—		2-3    —    —
Sea water — alteration	5		5    —    —
staining wool	4		4-5    —    —
Stoving	—		4    —    —
Washing — alteration	4		5    4-5    4
staining wool	4		4-5    4-5    3-4
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron			— Unaffected — Unaffected
<b>NON-TEXTILE USAGE</b>		Leather (main use). See Leather Dyes section	
<b>NOTES</b>	<b>Reactions in substance</b> $\text{H}_2\text{SO}_4$ conc.—dark green; on dilution—light brown. Aq. soln.+dilute HCl or dilute NaOH—no change		



246	247	C.I. Acid Brown
Azo (metal complex) —	Disazo —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Reddish brown —	Dull brown Trace redder	HUE Daylight Artificial light (tungsten)
	1,2  Moderate. Unsuitable for salting at boil — Acetate and cellulose—ss	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
	Silk: Neutral or slightly acid	DYEING: OTHER FIBRES
	Direct on nylon, silk and wool	PRINTING
	ISO  4-5 4-5 3 4-5 4 (duller)  6 6 6-7  4-5 4-5 4 (redder) 4-5  4-5 4-5 5 4-5 (duller) 3-4  5 5 3 (bluer) 4-5 5	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{8}$ - $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
	3-4 3-4 — 3-4	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
See Leather Dyes section		NON-TEXTILE USAGE
	In presence of chrome the hue on wool is yellower and duller <b>Reactions in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—bluish grey; on dilution—reddish grey. Aq. soln. + HCl—trace bluer; + NaOH—no change	NOTES

**C.I. Acid Brown 248-253**

<b>C.I. Acid Brown</b>	<b>248</b>	<b>249</b>	<b>250</b>
<b>CHEMICAL CLASS</b>	Nitro	Monoazo (metal complex)	Monoazo (1:2 metal complex)
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Brown Slightly redder	Reddish brown —	Reddish brown Slightly brighter and redder
<b>DYEING: WOOL</b> Method  Levelling — S.D.C. migration test method/grade Staining other fibres	3  Good — Acetate, acrylic, cellulose and polyester—ss	1, 2  Good. May be salted at boil — Acetate, acrylic, cellulose and polyester—ss	1, 2  Good. May be salted at boil — Acetate, acrylic, cellulose and polyester—ss
<b>DYEING: OTHER FIBRES</b>	Silk: Neutral or slightly acid	Nylon: $\text{Na}_3\text{PO}_4$ + acetic acid + levelling agent	Nylon: $\text{Na}_3\text{PO}_4$ + acetic acid + levelling agent
<b>PRINTING</b>		Direct on nylon, silk and wool	Direct on nylon, silk and wool
<b>FASTNESS PROPERTIES</b> Method	ISO	ISO	ISO
Alkali	4-5	4 (yellower)	4-5
Carbonising	5	4-5	5
Chlorination — alteration staining wool	3-4 (yellower, duller)	4 (yellower, duller)	4 (duller)
Decatising	4-5 5	4-5 4-5	4-5 4-5
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal	5-6 6 6-7	6 7 7-8	6-7 7 7-8
Milling, alkaline — alteration staining wool	— —	4-5 4-5	4-5 4
Milling, acid — alteration staining wool	3 2-3	3-4 (yellower) 3	4 (yellower) 3-4
Peroxide bleaching — alteration staining wool	2-3 3	4 (yellower) 3-4	4-5 3-4
Perspiration	4	5	5
Potting — alteration staining wool	— —	2 2	2 2
Sea water — alteration staining wool	4 4-5	5 5	5 5
Stoving	4-5	3-4 (yellower)	4 (yellower)
Washing — alteration staining wool	1-2 3-4	4-5 4-5	4 4
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Good 4-5 (duller) — 4-5	2-3 4 (yellower and duller) Little change 4-5	3-4 4 (duller) Little change 4-5
<b>NON-TEXTILE USAGE</b>			
<b>NOTES</b>	<b>Reactions in substance</b> $\text{H}_2\text{SO}_4$ conc.—greenish yellow; on dilution—no change Aq. soln. + HCl—no change; + NaOH—weaker	In presence of chrome the hue on wool is practically unchanged <b>Reactions in substance</b> $\text{H}_2\text{SO}_4$ conc.—olive; on dilution—yellowish pink. Aq. soln. + HCl—no change; + NaOH—weaker	In presence of chrome the hue on wool is unchanged <b>Reactions in substance</b> $\text{H}_2\text{SO}_4$ conc.—reddish brown; on dilution—dull reddish orange. Aq. soln. + HCl—trace duller; + NaOH—weaker



# C.I. Acid Brown 254-257

C.I. Acid Brown	254	255
CHEMICAL CLASS	Monoazo (1:2 metal complex)	Monoazo (1:2 metal complex)
C.I. CONSTITUTION NUMBER	—	—
HUE Daylight Artificial light (tungsten)	Dull yellowish orange→yellowish brown Slightly redder	Brown Slightly redder
DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres	1, 2  Good. May be salted at boil — Acetate and cotton— <i>vss</i> , viscose— <i>u</i>	1, 2  Good. May be salted at boil — Acetate and cellulose— <i>vss</i>
DYEING: OTHER FIBRES	Nylon: Weakly alkaline (ammonia), neutral or weakly acid; preferably with a levelling agent Silk: Neutral or acetic acid, preferably with a levelling agent*	Nylon: Weakly alkaline (ammonia), neutral or weakly acid, with a levelling agent Silk: neutral or acetic acid, preferably with a levelling agent Also for bast fibres
PRINTING	Direct on nylon, silk and wool Vigoureux printing	Direct on nylon, silk and wool Vigoureux printing
FASTNESS PROPERTIES Method	ISO	ISO
Alkali	4-5†	4*
Carbonising	—	—
Chlorination — alteration	4-5	4-5
staining wool	5	5
Decatising	4	3-4
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal	6-7	6
normal	7	6
2 × normal	7-8	6
Milling, alkaline — alteration	4	4-5
staining wool	4-5	4
Milling, acid — alteration	4	4
staining wool	4	4
Peroxide bleaching — alteration	4	4-5
staining wool	4	4
Perspiration	4-5	5
Potting — alteration	2	2
staining wool	1-2	1
Sea water — alteration	5	5
staining wool	5	5
Stoving	4	3
Washing — alteration	4-5	4-5
staining wool	4-5	4-5
OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron	Unsuitable for discharge grounds 4-5 — 2 (duller)	Unsuitable for discharge grounds 4 (yellow) — 4 (duller)
NON-TEXTILE USAGE	Fur See Leather Dyes section	Fur See Leather Dyes section
NOTES	*Also for bast fibres †Fastness on nylon (ISO): Light 6-7, 7, 7, Milling (alkaline) 4 (3-4), Perspiration 5, Washing 4-5 (3-4)	*Fastness on nylon (ISO): Light 6, 7, 8, Milling (alkaline) 4-5 (4-5), Perspiration 5, Washing 4-5 (4-5)



256	257	C.I. Acid Brown
Monoazo (1:2 metal complex)	Monoazo (1:2 metal complex)	CHEMICAL CLASS
—	—	C.I. CONSTITUTION NUMBER
Yellowish brown Slightly yellower	Brown Slightly redder	HUE Daylight Artificial light (tungsten)
1, 2  Good. May be salted at the boil — Acetate and cotton— <i>vss</i> , viscose— <i>u</i>	1, 2  Good. May be salted at the boil — Acetate and viscose— <i>vss</i> , cotton— <i>u</i>	DYEING: WOOL Method  Levelling • S.D.C. migration test method/grade Staining other fibres
Nylon: Weakly alkaline (ammonia), neutral or weakly acid, preferably with a levelling agent Silk: Neutral or acetic acid, preferably with a levelling agent*	Nylon: Weakly alkaline (ammonia), neutral or weakly acid, preferably with a levelling agent Silk: Neutral or acetic acid, preferably with a levelling agent*	DYEING: OTHER FIBRES
Direct on nylon, silk and wool Vigoureux printing	Direct on nylon, silk and wool Vigoureux printing	PRINTING
ISO  4† — 5 5 3-4  6 6 6-7  4-5 4-5 4-5 4  4-5 3-4 5 2 1  5 5 3 4-5 4	ISO  5† 4-5 4-5 5 4  6-7 6-7 7  4-5 4-5 4-5 4  4 3 5 2 1  5 5 4 4-5 4-5	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{8}$ - $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Unsuitable for discharge grounds 4-5 — 4 (yellower)	Dischargeable to white 4 (redder) Little change 4 (redder)	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
Fur See Leather Dyes section	Fur See Leather Dyes section	NON-TEXTILE USAGE
*Also for bast fibres †Fastness on nylon (ISO): Light 6-7, 7, 7-8, Milling (alkaline) 5 (5), Perspiration 5, Wash- ing 4-5 (4-5)	*Also for bast fibres †Fastness on nylon (ISO): Light 7, 7, 7-8, Milling (alkaline) 4 (3-4), Perspiration 4-5, Washing 4 (3-4)	NOTES

**C.I. Acid Brown 258-263**

<b>C.I. Acid Brown</b>	<b>258</b>	<b>259</b>	<b>260</b>
<b>CHEMICAL CLASS</b>	Monoazo (1:2 metal complex)	Azo (metallised)	Azo
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Brown Slightly brighter	Dark brown —	Orange brown —
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	1, 2  Good. May be salted at boil — Acetate— <i>vss</i> , cellulose— <i>u</i>		
<b>DYEING: OTHER FIBRES</b>	Nylon: Weakly alkaline (ammonia), neutral or weakly acid, preferably with a levelling agent Silk: Neutral or acetic acid, preferably with a levelling agent*		
<b>PRINTING</b>	Direct on nylon, silk and wool Vigoureux printing		
<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool	ISO  5† 5 5 5 4  6-7 6-7 7  4 4-5 4-5 3-4  3-4 3-4 5 1-2 1  5 5 4-5 4-5 4		
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Unsuitable for discharge grounds 4 (yellower) — 4-5		
<b>NON-TEXTILE USAGE</b>		See Leather Dyes section	See Leather Dyes section
<b>NOTES</b>	*Also for bast fibres †Fastness on nylon (ISO): Light 6, 6-7, 7, Milling (alkaline) 5 (4-5), Perspiration 5, Washing 4-5 (4)		



# C.I. Acid Brown 264-269

C.I. Acid Brown	264	265	266
CHEMICAL CLASS	Azo	Monoazo (metallised)	Azo
C.I. CONSTITUTION NUMBER	—	13260	—
HUE Daylight Artificial light (tungsten)	Brown —	Brown —	Brown —
DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres			
DYEING: OTHER FIBRES			
PRINTING			
FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool			
OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron			
NON-TEXTILE USAGE	See Leather Dyes section	See Leather Dyes section	See Leather Dyes section
NOTES			



267	268	269	C.I. Acid Brown
Azo —	Azo —	Nitro —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Reddish Brown —	Reddish Brown —	Brown Little yellower	HUE Daylight Artificial light (tungsten)
		2, 3  Very good — Acetate—s, cotton—u, viscose—ss	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
		Nylon: Formic acid Silk	DYEING: OTHER FIBRES
		Direct on nylon, silk and wool	PRINTING
		ISO  3-4* 3 — 4  3 3 4  — — — —  2-3 — —  3 3 2-3 2-3 3	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ - $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
		Not dischargeable to white Unaffected — Redder	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
See Leather Dyes section	See Leather Dyes section	See Leather Dyes section	NON-TEXTILE USAGE
		*Fastness on nylon (ISO): Light 3, Washing 2-3 (2-3) Fastness on silk (ISO): Light 3, 3, 4, Washing 2-3	NOTES

# C.I. Acid Brown 270-275

C.I. Acid Brown	270	271	272
CHEMICAL CLASS	Azo (metal complex)	Azo (metal complex)	Azo
C.I. CONSTITUTION NUMBER	—	—	—
HUE Daylight Artificial light (tungsten)	Brown —	Dull bordeaux→bluish brown —	Brown —
DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres			
DYEING: OTHER FIBRES			
PRINTING			
FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool			
OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron			
NON-TEXTILE USAGE	See Leather Dyes section	See Leather Dyes section	See Leather Dyes section
NOTES			



# C.I. Acid Brown 276-281

C.I. Acid Brown	276	277	278
<b>CHEMICAL CLASS</b>	Polyazo		Polyazo
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Yellowish brown —		Yellowish brown —
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres		This C.I. Generic Name is discontinued. The dyes formerly listed under it now appear under C.I. Acid Brown 98	
<b>DYEING: OTHER FIBRES</b>			
<b>PRINTING</b>			
<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{8}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool			
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron			
<b>NON-TEXTILE USAGE</b>	See Leather Dyes section		See Leather Dyes section
<b>NOTES</b>			



279	280	281	C.I. Acid Brown
Polyazo —	Trisazo —	Azo (metal complex) —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Brown —	Dull brownish olive Redder	Reddish brown —	HUE Daylight Artificial light (tungsten)
			DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
			DYEING: OTHER FIBRES
			PRINTING
			FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ – $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
			OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
See Leather Dyes section	See Leather Dyes section		NON-TEXTILE USAGE
			NOTES

# C.I. Acid Brown 282-286

C.I. Acid Brown	282	283
CHEMICAL CLASS	1:2 metal complex	1:2 metal complex
C.I. CONSTITUTION NUMBER	—	—
HUE Daylight Artificial light (tungsten)	Brown Redder	Reddish brown Redder
DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres	1  Moderate. Unsuitable for salting at boil — Acetate— <i>u</i> , cellulose— <i>ss</i>	1  Moderate. Unsuitable for salting at boil — Acetate— <i>u</i> , cellulose— <i>ss</i>
DYEING: OTHER FIBRES	Nylon: Weakly acid Silk: Acetic acid	Nylon: Weak acid
PRINTING	Direct on nylon, silk and wool	Direct on nylon, silk and wool
FASTNESS PROPERTIES Method	ISO	ISO
Alkali	4	4-5
Carbonising	4-5	4 (bluer, weaker)
Chlorination — alteration	4-5	4-5
staining wool	5	5
Decatising	4	4-5
Light, $\frac{1}{2}$ — normal	6	6
normal	6-7	6-7
2 × normal	7	7
Milling, alkaline — alteration	4-5	4-5
staining wool	4-5	4-5
Milling, acid — alteration	4-5	4-5
staining wool	5	4-5
Peroxide bleaching — alteration	4-5	4 (yellower, weaker)
staining wool	4-5	4
Perspiration	4-5 (alk.)	4-5 (alk.)
Potting — alteration	4 (bluer)	4 (bluer, weaker)
staining wool	2	2
Sea water — alteration	5	5
staining wool	5	5
Stoving	4 (yellower)	(4 yellower)
Washing — alteration	5	4
staining wool	4-5	4-5
OTHER PROPERTIES		
Dischargeability	2	2
Effect of metals — copper	Little change	Little change
chromium	—	—
iron	Little change	Little change
NON-TEXTILE USAGE	See Leather Dyes section	See Leather Dyes section
NOTES		Suitable for shading chrome dyeings



# C.I. Acid Brown 287-291

C.I. Acid Brown	287	288
CHEMICAL CLASS	Monoazo (1:2 metal complex)	Disazo
C.I. CONSTITUTION NUMBER	—	—
HUE Daylight Artificial light (tungsten)	Olive Redder	Brown Brighter
DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres	1, 2  — — Acetate and cellulose—u	
DYEING: OTHER FIBRES	Nylon: Neutral Silk: Ammonium acetate or broken soap bath	
PRINTING	Direct on wool; also Vigoureux printing	
FASTNESS PROPERTIES Method	■	
Alkali	4	
Carbonising	5	
Chlorination — alteration	5	
staining wool	5	
Decatising	—	
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	6	
normal	6-7	
2× normal	7	
Milling, alkaline — alteration	5	
staining wool	5	
Milling, acid — alteration	5	
staining wool	5	
Peroxide bleaching — alteration	4-5	
staining wool	5	
Perspiration	5	
Potting — alteration	2	
staining wool	2	
Sea water — alteration	5	
staining wool	5	
Stoving	5	
Washing — alteration	5	
staining wool	5	
OTHER PROPERTIES		
Dischargeability	2	
Effect of metals — copper	4	
chromium	—	
iron	5	
NON-TEXTILE USAGE		See Leather Dyes section
NOTES	*Methods of LBH	Reactions in substance H <sub>2</sub> SO <sub>4</sub> conc.—reddish violet solution; on dilution—brown. Aq. soln. + dilute HCl— no change; + dilute NaOH—redder



289	290	291	C.I. Acid Brown
Azo (metal complex) —	Azo —	Azo —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Brown Redder	Yellowish brown —	Reddish brown —	HUE Daylight Artificial light (tungsten)
1, 2  — — Acetate, acrylic and viscose—ss, cotton, modified acrylic and polyester—s			DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: Pre-scoured with Na <sub>3</sub> PO <sub>4</sub> and dyed with Na <sub>3</sub> PO <sub>4</sub> + ammonium sulphate Silk: Ammonium sulphate + acetic acid			DYEING: OTHER FIBRES
Direct on wool			PRINTING
ISO Wool ISO Nylon ISO Silk 4 4 4 4-5 4 — 3 (weaker) — — — — — 4-5 4-5 — 6 5-6 5-6 6-7 6-7 6 7 7 6-7 4-5 — — 5 — — 4 — — 4-5 — — — — — — — — 4-5 4 4-5 3-4 2 (weaker) — 1 1 — 4-5 4 4-5 5 4 4 — — — 4-5 4-5 (60°) 3-4 (60°) 4-5 4-5 4			FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ - $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
4 5 Duller 5			OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
See Leather Dyes section	See Leather Dyes section	See Leather Dyes section	NON-TEXTILE USAGE
Not sensitive to hard water			NOTES

### C.I. Acid Brown 292-295

<b>C.I. Acid Brown</b>	<b>292</b>	<b>293</b>
<b>CHEMICAL CLASS</b>	Monoazo (1:2 metal complex)	Monoazo (1:2 metal complex)
<b>C.I. CONSTITUTION NUMBER</b>	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Brown Redder	Reddish brown Yellower
<b>DYEING: WOOL</b> Method	1, 2	1, 2
Levelling S.D.C. migration test method/grade Staining other fibres	— — Acetate, acrylic, cellulose and triacetate—ss	— — Acetate, acrylic, triacetate and viscose—ss, cotton and polyester—u
<b>DYEING: OTHER FIBRES</b>	Nylon: Neutral	Nylon: Neutral
<b>PRINTING</b>		
<b>FASTNESS PROPERTIES</b> Method	ISO Wool	ISO Wool
Alkali	4-5	4-5
Carbonising	4-5	4-5
Chlorination — alteration	4	4
staining wool	—	—
Decatising	4-5	4-5
Light, $\frac{1}{8}$ - $\frac{1}{2}$ normal	6	5-6
normal	6-7	6-7
2x normal	7	6-7
Milling, alkaline — alteration	4-5	5
staining wool	4-5	5
Milling, acid — alteration	4	4-5
staining wool	4-5	4
Peroxide bleaching — alteration	4-5	4-5
staining wool	5	4
Perspiration	5	5
Potting — alteration	2-3	2
staining wool	1	1
Sea water — alteration	5	5
staining wool	5	5
Stoving	4	4
Washing — alteration	4-5	4-5
staining wool	4-5	4-5
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Fair 3-4 (yellower) 3-4 4	Poor 3-4 (redder) 3-4 4
<b>NON-TEXTILE USAGE</b>		
<b>NOTES</b>		

294	295	C.I. Acid Brown
Azo (metallised) —	Azo (metallised) —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Brown Yellower	Brownish olive Greener	HUE Daylight Artificial light (tungsten)
1, 2  Good — Acetate and cotton— <i>ss</i> , acrylic, polyester and viscose— <i>u</i>	1, 2  Good — Acetate and cotton— <i>ss</i> , acrylic, polyester and viscose— <i>u</i>	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: Ammonium acetate Silk: Neutral or weakly acid	Nylon: Ammonium acetate Silk: Neutral or weakly acid	DYEING: OTHER FIBRES
Direct on nylon, silk and wool Vigoureux printing	Direct on nylon, silk and wool Vigoureux printing	PRINTING
ISO 4-5 — — — 4-5  5-6 6-7 —  3-4 4 — —  4 3 4-5 4-5 2  4-5 5 — 4-5 5	ISO 4-5 — — — 4-5  4 5 —  4 4-5 — —  4-5 4 4-5 4-5 2  4-5 5 — 4-5 5	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
3 — Little change —	3 — Little change —	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
		NON-TEXTILE USAGE
		NOTES

**C.I. Acid Brown 296-301**

<b>C.I. Acid Brown</b>	<b>296</b>	<b>297</b>	<b>298</b>
<b>CHEMICAL CLASS</b>	Azo (metallised)	Azo (metallised)	Azo (metal complex)
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Brown Redder	Reddish brown Yellower	Reddish brown Redder
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	1, 2  Good — Acetate and cotton— <i>ss</i> , acry- lic, polyester and viscose— <i>u</i>	1, 2  Good — Acetate and cellulose— <i>ss</i> , acrylic and polyester— <i>u</i>	1,2  — — Acetate— <i>u</i> , acrylic, cotton and polyester— <i>s</i>
<b>DYEING: OTHER FIBRES</b>	Nylon: Ammonium acetate Silk: Neutral or weakly acid	Nylon: Ammonium acetate Silk: Neutral or weakly acid	Nylon: Weakly alkaline (pH 7.5-8 for nylon 6.6, pH 8-8.5 for nylon 6) Silk: Neutral or weakly acid
<b>PRINTING</b>	Direct on nylon, silk and wool Vigoureux printing	Direct on nylon, silk and wool Vigoureux printing	Direct on wool
<b>FASTNESS PROPERTIES</b> Method	ISO	ISO	ISO Wool    ISO Nylon    ISO Silk
Alkali	4-5	4-5	4    4    4
Carbonising	—	—	4    4    —
Chlorination — alteration	—	—	3-4    —    —
staining wool	—	—	—    —    —
Decatising	4-5	4-5	4    5    —
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal	5	5	6    5-6    5-6
normal	5-6	5	6-7    6-7    6
2× normal	—	—	7    7    6-7
Milling, alkaline — alteration	3-4	3-4	4-5    4-5    —
staining wool	4	4	4-5    4-5    —
Milling, acid — alteration	—	—	4    —    —
staining wool	—	—	3-4    —    —
Peroxide bleaching — alteration	3-4	4	—    —    —
staining wool	3	2-3	—    —    —
Perspiration	4-5	5	4-5    4-5    4-5
Potting — alteration	4-5	4-5	4    (2-3 weaker)    3-4
staining wool	2-3	3	2    1-2    —
Sea water — alteration	4-5	5	4-5    4-5    —
staining wool	4-5	4-5	5    4-5    —
Stoving	—	—	—    —    —
Washing — alteration	4-5	4-5	4    4-5    4
staining wool	5	5	4-5    4    4
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	4 — Little change —	3 — Little change —	3-4 4 Duller 5
<b>NON-TEXTILE USAGE</b>			See Leather Dyes section
<b>NOTES</b>			



299	300	301	C.I. Acid Brown
Azo (1:2 metal complex) —	Azo (1:2 metal complex) —	Azo —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Brown Yellower	Reddish brown Redder	Brown Redder	HUE Daylight Artificial light (tungsten)
1, 2 Moderate—good — Cotton— <i>ss</i> , acetate, viscose— <i>s</i> , acrylic— <i>hs</i> , nylon, silk— <i>vhs</i>	1, 2 Moderate—good — Acetate— <i>s</i> , viscose— <i>hs</i> , acrylic, nylon, silk— <i>vhs</i>	1, 2 — — —	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
		Nylon: neutral or weakly acid (cotton— <i>ss</i> ) Silk	DYEING: OTHER FIBRES
Direct on wool and nylon	Direct on wool and nylon	Wool, nylon, silk	PRINTING
AATCC 5 — — — — — 6 — — 4 3-4 — — 5 4-5 4-5 4-5 2 — 5 4-5 — 4-5 4-5	AATCC 5 — — — — — 6 — — 4 4 — — 5 4 4-5 4-5 2 — 4-5 4-5 — 4-5 5	ISO Nylon — — — — — 3 3-4 4-5 — 4-5 4* — — — — 5 — — 5* 4-5 4-5† — — 4-5 5* — 4-5 4-5	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2× normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Good Slightly affected — Slightly affected	Very good Slightly affected — Definite change		OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
			NON-TEXTILE USAGE
		*Staining nylon 5 †Staining nylon 4-5	NOTES

# C.I. Acid Brown 302-308

C.I. Acid Brown	302	303	304
<b>CHEMICAL CLASS</b>	Monoazo (metallised)	Monoazo (metal complex)	Azo (1:2 metal complex)
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Reddish brown Much redder	Brown —	Brown Yellower
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	3  — — Acetate and cellulose —ss, polyester—u		
<b>DYEING: OTHER FIBRES</b>	Nylon: sulphuric or formic acid Silk: acetic or formic acid + Na <sub>2</sub> SO <sub>4</sub>		Nylon: Ammonium sulphate + levelling agent (at boil or 110–120°C.). Good coverage of barré nylon at high tem- peratures (Cotton—s, polyester—ss)
<b>PRINTING</b>	Direct on nylon, silk and wool		
<b>FASTNESS PROPERTIES</b> Method	ISO		ISO Nylon*
Alkali	4		—
Carbonising	4–5		—
Chlorination — alteration	—		—
staining wool	—		—
Decatising	—		3
Light, $\frac{1}{3}$ – $\frac{1}{2}$ normal	5		6–7
normal	5–6		7
2 × normal	6		7–8
Milling, alkaline — alteration	3		—
staining wool	4		—
Milling, acid — alteration	3		—
staining wool	1		—
Peroxide bleaching — alteration	1		—
staining wool	4		—
Perspiration	4 (acid)		5
Potting — alteration	3		—
staining wool	2		—
Sea water — alteration	4		5
staining wool	4		5
Stoving	—		—
Washing — alteration	4		5 (60°)
staining wool	5		4–5
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Moderate — — —		Fair–good — — —
<b>NON-TEXTILE USAGE</b>		See Leather Dyes section	See Leather Dyes section
<b>NOTES</b>			*Additional fastness properties on nylon (ISO): Water (severe) 5 (5), Rubbing 5, Hot pressing 5 (5), Heat 5

305	306,307	308	C.I. Acid Brown
Trisazo —	Trisazo —	Tetrakisazo —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Yellowish brown —	Reddish brown —	Brown —	HUE Daylight Artificial light (tungsten)
			DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
			DYEING: OTHER FIBRES
			PRINTING
			FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ – $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
			OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
See Leather Dyes section	See Leather Dyes section	See Leather Dyes section	NON-TEXTILE USAGE
			NOTES

**C.I. Acid Brown 309–314**

<b>C.I. Acid Brown</b>	<b>309</b>	<b>310</b>	<b>311</b>
<b>CHEMICAL CLASS</b>	Tetrakisazo	Trisazo	Azo (metal complex)
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Dark brown —	Dark brown —	Dark yellowish brown —
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres			
<b>DYEING: OTHER FIBRES</b>			
<b>PRINTING</b>			
<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool			
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron			
<b>NON-TEXTILE USAGE</b>	See Leather Dyes section	See Leather Dyes section	See Leather Dyes section
<b>NOTES</b>			



312	313	314	C.I. Acid Brown
	Azo —	Azo —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
	Brown —	Yellowish brown —	HUE Daylight Artificial light (tungsten)
This C.I. Generic Name is discontinued. The dyes formerly listed under it now appear under C.I. Acid Brown 298			DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
			DYEING: OTHER FIBRES
			PRINTING
			FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
			OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
	See Leather Dyes section	See Leather Dyes section	NON-TEXTILE USAGE
			NOTES

# C.I. Acid Brown 315-322

C.I. Acid Brown	315	316	317
CHEMICAL CLASS	Monoazo (metal complex)	Monoazo (metal complex)	Monoazo (metal complex)
C.I. CONSTITUTION NUMBER	—	—	—
HUE Daylight Artificial light (tungsten)	Yellowish brown —	Reddish brown —	Dull greenish brown —
DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres			
DYEING: OTHER FIBRES			
PRINTING			
FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool			
OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron			
NON-TEXTILE USAGE	Anodised aluminium Light 7	Anodised aluminium Light 7-8 Weathering very good	Anodised aluminium Light 7 Weathering fairly good
NOTES			

<b>318, 319</b>	<b>320</b>	<b>321, 322</b>	<b>C.I. Acid Brown</b>
Disazo —	Polyazo —	Polyazo —	<b>CHEMICAL CLASS</b> <b>C.I. CONSTITUTION NUMBER</b>
Dark brown —	Dull brown —	Brown —	<b>HUE</b> Daylight Artificial light (tungsten)
			<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres
			<b>DYEING: OTHER FIBRES</b>
			<b>PRINTING</b>
			<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ – $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
			<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron
See Leather Dyes section	See Leather Dyes section	See Leather Dyes section	<b>NON-TEXTILE USAGE</b>
			<b>NOTES</b>

**C.I. Acid Brown 323–328**

<b>C.I. Acid Brown</b>	<b>323</b>	<b>324</b>	<b>325</b>
<b>CHEMICAL CLASS</b>	Disazo	Monoazo	Polyazo
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Brown Redder	Yellowish brown Yellower	Reddish brown Redder
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres			
<b>DYEING: OTHER FIBRES</b>			
<b>PRINTING</b>			
<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool			
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron			
<b>NON-TEXTILE USAGE</b>	Paper: Fastness properties (ISO): Sulphuric acid 2–3, bleeding 2–3; Acetic acid 4, bleeding 4; Ammonia 2–3, bleeding 2; Na <sub>2</sub> CO <sub>3</sub> 2, bleed- ing 2; Light 3 pale, 4–5 deep; Water 4	See Leather Dyes section	See Leather Dyes section
<b>NOTES</b>			



326	327	328	C.I. Acid Brown
Disazo —	Disazo —	Azo (1:2 metal complex) —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Yellowish brown Yellower	Reddish brown Redder	Brown Greener	HUE Daylight Artificial light (tungsten)
		1, 2  Good — Acetate, cotton, polyester, viscose—ss; Acrylic—vss	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
		Nylon, unweighted silk	DYEING: OTHER FIBRES
		Vigoureux printing	PRINTING
		ISO Wool                      Nylon 4                      — 4                      — 4                      — 4-5                      — 4-5                      —  5-6                      6 6                      6 7                      7  4                      5 4                      4-5 4                      — 4-5                      —  4                      — 3-4                      — 5                      4-5 2                      — 2                      —  5                      5 5                      5 4                      — 4                      4-5* 4-5                      —	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
		2 4-5 4-5 4-5	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
See Leather Dyes section	See Leather Dyes section		NON-TEXTILE USAGE
		*ISO 1 Silk—Light 5-6, 6, 6-7; Perspiration 4; Stoving 4-5; Washing (ISO 1) 3-4, 5.	NOTES

**C.I. Acid Brown 329-334**

<b>C.I. Acid Brown</b>	<b>329</b>	<b>330</b>	<b>331</b>
<b>CHEMICAL CLASS</b>	Azo (1:2 metal complex)	Azo (1:2 metal complex)	Azo (1:2 metal complex)
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Yellowish brown Yellower	Reddish brown Redder	Brown Greener
<b>DYEING: WOOL</b> Method		1, 2	1, 2
Levelling S.D.C. migration test method/grade Staining other fibres		4 — —	4 — —
<b>DYEING: OTHER FIBRES</b>	Nylon	Nylon	Nylon
<b>PRINTING</b>			
<b>FASTNESS PROPERTIES</b> Method	ISO Nylon	ISO Wool Nylon	ISO Wool Nylon
Alkali	5	—	—
Carbonising	—	4-5	4-5
Chlorination — alteration	4-5*	4	4
staining wool	—	4-5	4-5
Decatising	4	4-5	4-5
Light, $\frac{1}{2}$ — normal	5-6	6	6
normal	6	6-7	6
2 × normal	6-7	7	6-7
Milling, alkaline — alteration	5	4	4
staining wool	5†	4	4-5
Milling, acid — alteration	—	—	—
staining wool	—	—	—
Peroxide bleaching — alteration	—	—	—
staining wool	—	—	—
Perspiration	5	5	5
Potting — alteration	—	2	2
staining wool	—	2	2
Sea water — alteration	4-5	5	5
staining wool	5†	5	5
Stoving	—	—	—
Washing — alteration	4-5	4	3-4
staining wool	4-5†	4	4
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron			
<b>NON-TEXTILE USAGE</b>			
<b>NOTES</b>	*Chlorinated water †Nylon		*Nylon

<b>332</b>	<b>333</b>	<b>334</b>	<b>C.I. Acid Brown</b>
Polyazo (metal complex) —	Azo —	Tetrakisazo —	<b>CHEMICAL CLASS</b> <b>C.I. CONSTITUTION NUMBER</b>
Brown —	Brown Redder	Brown —	<b>HUE</b> Daylight Artificial light (tungsten)
	2  3-4 — —		<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres
			<b>DYEING: OTHER FIBRES</b>
			<b>PRINTING</b>
	ISO  — 5 — — 5  3-4 4 4-5  4 — 4 —  — — 4 4-5 3-4  4-5 — — 4-5 4-5		<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{8}$ - $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
	3-4 — — —		<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron
See Leather Dyes section		See Leather Dyes section	<b>NON-TEXTILE USAGE</b>
	Additional fastness properties on wool (ISO): Hot pressing 5, Rubbing 4-5, Water 5 (4-5)		<b>NOTES</b>

**C.I. Acid Brown 335-339**

<b>C.I. Acid Brown</b>	<b>335</b>	<b>336</b>	<b>337</b>
<b>CHEMICAL CLASS</b>	Azo (1:2 metal complex)	Azo (metal complex)	Azo (metal complex)
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Reddish Brown Redder	Dark brown —	Dark brown —
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres			
<b>DYEING: OTHER FIBRES</b>	Nylon: pH 6.0-6.5	Nylon and silk	
<b>PRINTING</b>			
<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool	ISO Nylon — — 4* — 4-5  6-7 6-7 6-7  — — — — — — — 5 — —  4-5 4-5† — 4-5 4-5†	ISO Nylon and Silk — — — — —  — 4 —  — — — — — — 4-5 — —  — — — 4-5 (40°C) —	
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron			
<b>NON-TEXTILE USAGE</b>		See Leather Dyes section	See Leather Dyes section
<b>NOTES</b>	*Chlorinated water †Nylon	Additional fastness properties on nylon and silk (ISO): Hot pressing (immediately) 5, Rubbing (wet and dry) 5, Water 4-5	



<b>338</b>	<b>339</b>	<b>C.I. Acid Brown</b>
Polyazo —	Azo —	<b>CHEMICAL CLASS</b> <b>C.I. CONSTITUTION NUMBER</b>
Brown —	Reddish brown No change	<b>HUE</b> Daylight Artificial light (tungsten)
		<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres
		<b>DYEING: OTHER FIBRES</b>
		<b>PRINTING</b>
		<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
		<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron
See Leather Dyes section	See Leather Dyes section	<b>NON-TEXTILE USAGE</b>
		<b>NOTES</b>

# C.I. Acid Brown 340-345

C.I. Acid Brown	340	341	342
CHEMICAL CLASS	Monoazo	Disazo	Trisazo
C.I. CONSTITUTION NUMBER	—	—	—
HUE Daylight Artificial light (tungsten)	Brownish Olive —	Brown —	Brown —
DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres			
DYEING: OTHER FIBRES			
PRINTING			
FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool			
OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron			
NON-TEXTILE USAGE	See Leather Dyes section	See Leather Dyes section	See Leather Dyes section
NOTES			

343	344	345	C.I. Acid Brown
Trisazo —	Disazo (metal complex) —	Monoazo —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Reddish Brown —	Brown —	Brown —	HUE Daylight Artificial light (tungsten)
			DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
			DYEING: OTHER FIBRES
			PRINTING
			FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ - $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
			OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
See Leather Dyes section	See Leather Dyes section	See Leather Dyes section	NON-TEXTILE USAGE
			NOTES

**C.I. Acid Brown 346-351**

<b>C.I. Acid Brown</b>	<b>346</b>	<b>347</b>	<b>348</b>
<b>CHEMICAL CLASS</b>	Azo (1:2 metal complex)	Polyazo	Trisazo
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Reddish brown Redder	Brown —	Dull reddish brown —
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	1, 2  Good; suitable for salting at boil — Cellulose, acetate, acrylic and poly- ester—ss		
<b>DYEING: OTHER FIBRES</b>	Nylon and silk: neutral or weakly acid		
<b>PRINTING</b>	Direct on nylon, silk and wool Vigoureux processes		
<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool	ISO  4-5 4-5 — 4-5  6-7 7 7-8  4-5 4-5 5 4-5  4-5 4 4-5 (pH 8-0) 4 2  4-5 5 4 (yellower) 4-5 4-5		
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	4 4 (bluer) — 4-5 (duller)		
<b>NON-TEXTILE USAGE</b>	Leather Fur	See Leather Dyes sec- tion	See Leather Dyes sec- tion
<b>NOTES</b>	Solubility in water: excellent. The hue on wool is unaffected by the presence of chrome. On silk the fast- ness properties are similar to those on wool <b>Reactions in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—reddish brown; on dilu—no change. Aq. soln. + HCl— dull brown; + NaOH—bordeaux		



<b>349</b>	<b>350</b>	<b>351</b>	<b>C.I. Acid Brown</b>
Trisazo —	Polyazo —	Polyazo —	<b>CHEMICAL CLASS</b> <b>C.I. CONSTITUTION NUMBER</b>
Dull reddish brown —	Yellowish brown —	Greenish brown —	<b>HUE</b> Daylight Artificial light (tungsten)
			<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres
			<b>DYEING: OTHER FIBRES</b>
			<b>PRINTING</b>
			<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{8}$ – $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
			<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron
See Leather Dyes section	See Leather Dyes section	See Leather Dyes section	<b>NON-TEXTILE USAGE</b>
			<b>NOTES</b>

### C.I. Acid Brown 352-353

C.I. Acid Brown	352	353	
<b>CHEMICAL CLASS</b>	Monoazo (metallised)	Monoazo (metallised)	
<b>C.I. CONSTITUTION NUMBER</b>	—	—	
<b>HUE</b> Daylight Artificial light (tungsten)	Reddish brown —	Reddish brown —	
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	1, 2  Good — Cotton—3-4, nylon—1, silk—1	1, 2  Good — Cotton—3, nylon—1, silk—1	
<b>DYEING: OTHER FIBRES</b>	Nylon and silk: neutral or weakly acid	Nylon and silk: neutral or weakly acid	
<b>PRINTING</b>	Direct on nylon, silk and wool	Direct on nylon, silk and wool	
<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool	JIS  5 — — — —  6 — 7-8  4 3 4-5 3-4  2 2 5 4 2  5 5 — 5 5	JIS  5 — — — —  — 6-7 8  4 3 4 3-4  3 2 5 4-5 2-3  5 5 — 5 5	
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Good — — —	Moderate — — —	
<b>NON-TEXTILE USAGE</b>			
<b>NOTES</b>			

# C.I. Acid Black 1—3

C.I. Acid Black	1	2	3
<b>CHEMICAL CLASS</b>	Disazo	Azine	Disazo
<b>C.I. CONSTITUTION NUMBER</b>	20470	50420	27260
<b>HUE</b> Daylight Artificial light (tungsten)	Bluish black Little greener	Black	Bluish black Redder
<b>DYEING: WOOL</b> Method	2, 3	3	2, 3
Levelling S.D.C. migration test method/grade Staining other fibres	Moderate to good I/3	— — —	Moderate to good  Silk, cellulose and acetate —ss
<b>DYEING: OTHER FIBRES</b>	Nylon: formic acid Silk: acetic or sulphuric acid or broken degumming liquor	Silk: broken degumming liquor	
<b>PRINTING</b>	Direct on wool, silk and nylon		
<b>FASTNESS PROPERTIES</b> Method	AATCC	ISO Silk	ISO
Alkali	4-5	4	4
Carbonising	4	4-5	4-5
Chlorination — alteration	—	4	4
staining wool	—	3-4	4-5
Decatising	5	4-5	4-5
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal	—	—	—
normal	7	5	6
2× normal	8	—	—
Milling, alkaline — alteration	2	2	1-2
staining wool	2	1	—
Milling, acid — alteration	—	4	4
staining wool	—	2	4
Peroxide bleaching — alteration	—	—	4
staining wool	—	—	4
Perspiration	—	—	3-4
Potting — alteration	—	—	2-3
staining wool	—	—	4-5
Sea water — alteration	—	—	3
staining wool	—	—	—
Stoving	—	—	2-3
Washing — alteration	—	—	3
staining wool	—	—	4
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Moderate Little change — Weaker and greener		Poor Little duller — Little duller
<b>NON-TEXTILE USAGE</b>	Paper. Anodised aluminium, casein buttons, soaps, wood stains, writing inks, urea-mela- mine moulding powders Biological stain. Drugs Cosmetics See Leather Dyes section	See Leather Dyes section Paper Anodised aluminium Inks. Soap	
<b>NOTES</b>	Fastness to perspiration, stov- ing and washing is lower on silk than on wool		

# C.I. Acid Black 4—8

C.I. Acid Black	4	5	5:1
CHEMICAL CLASS	Tetrakisazo	Disazo	Disazo
C.I. CONSTITUTION NUMBER	35420	27510	
HUE Daylight Artificial light (tungsten)	Reddish black Little bluer	Black Little change	
DYEING: WOOL Method	2, 3	3	Slightly different chemically from C.I. Acid Black 5 but similar in properties and uses and redder in hue
Levelling	Good	Good	
S.D.C. migration test method/grade	—	—	
Staining other fibres	Acetate—u, cellulose and silk—ss	Cellulose and acetate—ss	
DYEING: OTHER FIBRES		Silk: acetic or sulphuric acid	
PRINTING			
FASTNESS PROPERTIES Method	ISO	ISO	
Alkali	2	4	
Carbonising	2-3	4	
Chlorination — alteration	—	—	
staining wool	—	—	
Decatising	4-5	4	
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal	—	—	
normal	4	6-7	
2 × normal	—	—	
Milling, alkaline — alteration	1-2	2	
staining wool	—	—	
Milling, acid — alteration	—	—	
staining wool	—	—	
Peroxide bleaching — alteration	—	—	
staining wool	—	—	
Perspiration	2	2-3	
Potting — alteration	—	—	
staining wool	—	—	
Sea water — alteration	1-2	2-3	
staining wool	—	—	
Stoving	3	4	
Washing — alteration	2-3	3	
staining wool	—	—	
OTHER PROPERTIES			
Dischargeability	Poor	Poor	
Effect of metals — copper	Weaker	Little change	
chromium	—	—	
iron	Slightly weaker	Little change	
NON-TEXTILE USAGE			
NOTES	Its good penetration makes it suitable for wool and fur hat bodies	Fastness on silk similar to that on wool	





**C.I. Acid Black 9—14**

<b>C.I. Acid Black</b>	<b>9</b>	<b>10</b>	<b>11</b>
<b>CHEMICAL CLASS</b>	Disazo	Disazo	Disazo
<b>C.I. CONSTITUTION NUMBER</b>			—
<b>HUE</b> Daylight Artificial light (tungsten)	Black Little change	Black —	Bluish black Little change
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	3  Moderate — Cellulose and acetate— <i>hs</i>	3  Moderate — Silk and cellulose— <i>ss</i> , acetate— <i>u</i>	2, 3  Moderate — Silk— <i>hs</i> , cellulose and acetate— <i>ss</i>
<b>DYEING: OTHER FIBRES</b>	Silk: acetic acid		
<b>PRINTING</b>			
<b>FASTNESS PROPERTIES</b> Method	ISO	ISO	ISO
Alkali	4-5	4	4
Carbonising	5	5	4-5
Chlorination — alteration staining wool	3-4 —	— —	— —
Decatising	5	4	4
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal	4-5 5 5-6	— 6 —	— 5 —
Milling, alkaline — alteration staining wool	2 —	— —	2 —
Milling, acid — alteration staining wool	3 —	5 5	— —
Peroxide bleaching — alteration staining wool	3-4 —	— —	— —
Perspiration	2-3	3	3
Potting — alteration staining wool	3-4 —	— —	— —
Sea water — alteration staining wool	3-4 —	— —	2-3 —
Stoving	4	1-2	4
Washing — alteration staining wool	2-3 —	2-3 3	3 —
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Poor Little change — Little change	Good Appreciable change — —	Moderate Little change — Little change
<b>NON-TEXTILE USAGE</b>		Precipitated colour lakes Paper	Feathers Furs
<b>NOTES</b>	Fastness to milling, perspiration, washing and sea water is rather lower on silk than on wool		<b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—green

<b>12</b>	<b>13</b>	<b>14</b>	<b>C.I. Acid Black</b>
Disazo —	Disazo —	Disazo	<b>CHEMICAL CLASS</b> <b>C.I. CONSTITUTION NUMBER</b>
Reddish black Little duller	Reddish black Little redder	Greenish black Little duller	<b>HUE</b> Daylight Artificial light (tungsten)
2, 3  Good Nylon— <i>d</i> , silk— <i>hs</i> , cellulose— <i>ss</i> , acetate— <i>u</i>	2, 3  Good Nylon— <i>d</i> (maroon), silk— <i>d</i> (violet), cellulose— <i>ss</i> , acetate— <i>u</i>	2, 3  — Silk— <i>d</i> (greenish blue), cellulose— <i>ss</i> , acetate— <i>u</i>	<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres
		Nylon: formic acid	<b>DYEING: OTHER FIBRES</b>
			<b>PRINTING</b>
AATCC 5 5 — —  6 —  1 — — —  4-5 — 1 2 —	AATCC 5 5 — — —  7-8 —  1 — — —  4-5 1 — —  4 1 2-3 —	AATCC 2 5 — — —  7-8 —  1 — — —  2 — 2 2 —  2 — 2 1 —	<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ - $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Poor Little change — Much duller	Moderate Little change Little change Redder and weaker	Moderate to good Slightly redder — Much greener and duller	<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron
See Leather Dyes section		See Leather Dyes section	<b>NON-TEXTILE USAGE</b>
<b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—bluish black	<b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—bluish green	<b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—dark green	<b>NOTES</b>

# C.I. Acid Black 15—19

C.I. Acid Black	15	16	16:1
<b>CHEMICAL CLASS</b>	Disazo	Disazo	Disazo
<b>C.I. CONSTITUTION NUMBER</b>	—	20345	
<b>HUE</b> Daylight Artificial light (tungsten)	Greenish black Slightly duller	Black Little change	
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	2, 3  Good — Silk— <i>d</i> , cellulose and acetate— <i>ss</i>	2, 3  Good — Cellulose and acetate— <i>ss</i>	Slightly different chemically from C.I. Acid Black 16 but similar in properties and usage
<b>DYEING: OTHER FIBRES</b>	Nylon: formic acid	Nylon and silk: acetic or formic acid	
<b>PRINTING</b>			
<b>FASTNESS PROPERTIES</b> Method	AATCC	AATCC	ISO
Alkali	5	5	4
Carbonising	5	5	4
Chlorination — alteration	—	—	—
staining wool	—	—	—
Decatising	—	—	4-5
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	—	—	—
normal	6-7	8	6
2 × normal	—	—	—
Milling, alkaline — alteration	1	1	2
staining wool	—	—	—
Milling, acid — alteration	—	—	—
staining wool	—	—	—
Peroxide bleaching — alteration	2-3	5	3
staining wool	—	3	1
Perspiration	1	1	3-4
Potting — alteration	—	—	—
staining wool	—	—	—
Sea water — alteration	3-4	4	3-4
staining wool	—	—	—
Stoving	2	4	2
Washing — alteration	1	1	3
staining wool	—	—	—
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Moderate Little change — Weaker and greener	Poor Little change — Slightly weaker	
<b>NON-TEXTILE USAGE</b>	See Leather Dyes section	See Leather Dyes section	
<b>NOTES</b>	Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—dark green		



17	18	19	C.I. Acid Black
Disazo 20350	Disazo 27790	Polyazo —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Reddish black Bluer	Bluish black Slightly duller	Black Slightly redder	HUE Daylight Artificial light (tungsten)
2, 3  Moderate — Silk— <i>hs</i> , cellulose and acetate— <i>ss</i>	2, 3  Good — Nylon— <i>d</i> , silk— <i>d</i> (blue), cellulose— <i>s</i> , acetate— <i>ss</i>	2, 3  Moderate — Acetate— <i>hs</i> , cellulose— <i>s</i>	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
		Silk: neutral or acetic acid or broken degumming liquor	DYEING: OTHER FIBRES
			PRINTING
ISO 4-5 4-5 — 4-5  — 5-6 —  2 — — —  — — 2-3 —  2 — 4 3 —	AATCC 5 4 — — —  7-8 —  1-2 — — —  2 2 1 —  3 3 3 4	ISO 4 4 4 5 3-4  — 6-7 7-8  — 3-4 3 4 —  4-5 — 5 —  5 — 4 4-5 5	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Moderate Slightly weaker — Little change	Moderate Unchanged Little effect Much weaker	Fairly good Slight change Little effect Slight change	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
	Wood dyeing and staining See Leather Dyes section		NON-TEXTILE USAGE
			NOTES

# C.I. Acid Black 20—25

C.I. Acid Black	20	21	22
<b>CHEMICAL CLASS</b>	Disazo	Disazo	Monoazo
<b>C.I. CONSTITUTION NUMBER</b>	27065	26405	—
<b>HUE</b> Daylight Artificial light (tungsten)	Violet black —	Black Slightly redder	Reddish black Little change
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres		1, 2  Moderate — Cellulose and acetate—ss	2  Good — Acetate—ss, cellulose—u
<b>DYEING: OTHER FIBRES</b>		Silk: acetic acid	Nylon: acetic or formic acid Silk: acetic acid
<b>PRINTING</b>		Direct on wool, silk, nylon and viscose	Direct on wool and silk
<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool		ISO  4 4 5 5 5  — 6 —  4–5 — 4 4  4 3–4 4–5 — —  4–5 4–5 1 5 4	ISO  4–5 4 — — 4  — 6 —  3–4 — — —  — — 4 — —  4–5 — 4–5 4–5 —
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron		Poor to moderate (2) Unaffected 3 Redder, slightly weaker	Moderate Little change — Little change
<b>NON-TEXTILE USAGE</b>		See Leather Dyes section	
<b>NOTES</b>		Solubility 20 g/l	<b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—violet

23	24	25	C.I. Acid Black
Disazo 27230	Disazo 26370	— —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Black	Bluish black Slightly redder	Bluish grey→bluish black	HUE Daylight Artificial light (tungsten)
2	1, 2  IV/2 Cellulose—s, acetate—ss		DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
	Nylon: acetic acid Silk: neutral or acetic acid or broken degumming liquor		DYEING: OTHER FIBRES
	Direct on wool, silk, nylon and viscose		PRINTING
Good	AATCC	ISO	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool  Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool  Perspiration Potting — alteration staining wool  Sea water — alteration staining wool  Stoving Washing — alteration staining wool
	4-5	5	
	4-5	4-5	
	—	4	
	—	1	
	4	3-4	
	3	5	
	5	6	
	7	6-7	
	3-4	4	
3-4	1		
—	4		
—	2-3		
2-3	4		
2-3	2		
4	4-5		
—	2-3		
—	1		
3	4-5		
3	3-4		
1	1		
3-4	3-4		
3-4	2-3		
	Poor Little change Little change Little change		OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
	Barium salt used as pig- ment See Leather Dyes section	Leather: on vegetable, chrome and semi-chrome tannages	NON-TEXTILE USAGE
			NOTES

**C.I. Acid Black 26—27**

<b>C.I. Acid Black</b>	<b>26</b>	<b>26:1</b>	<b>26:2</b>
<b>CHEMICAL CLASS</b>	Disazo	Disazo	Disazo
<b>C.I. CONSTITUTION NUMBER</b>	27070	27075	26690
<b>HUE</b> Daylight Artificial light (tungsten)	Navy→bluish black Slightly redder		
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	2  — IV/3 Cellulose and acetate—s	Properties and uses are the same as those of C.I. Acid Black 26	Properties and uses are the same as those of C.I. Acid Black 26
<b>DYEING: OTHER FIBRES</b>	Nylon: acetic or formic acid Silk: neutral or acetic acid		
<b>PRINTING</b>			
<b>FASTNESS PROPERTIES</b> Method	AATCC	ISO	
Alkali	4-5	4-5	
Carbonising	5	4-5	
Chlorination — alteration	—	4	
staining wool	—	1	
Decatising	3	4	
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal	—	—	
normal	5	4	
2 × normal	—	—	
Milling, alkaline — alteration	2	4	
staining wool	2	2	
Milling, acid — alteration	—	4	
staining wool	—	1	
Peroxide bleaching — alteration	4	4	
staining wool	4	1	
Perspiration	4-5	4-5	
Potting — alteration	—	1	
staining wool	—	1	
Sea water — alteration	4	4-5	
staining wool	4	3	
Stoving	3	3-4	
Washing — alteration	3	3-4	
staining wool	3	1	
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Moderate to good Slightly duller Little effect Slightly duller		
<b>NON-TEXTILE USAGE</b>	See Leather Dyes section		
<b>NOTES</b>			



<b>26:3</b>	<b>26:4</b>	<b>27</b>	<b>C.I. Acid Black</b>
Disazo	Disazo	Disazo 26310	<b>CHEMICAL CLASS</b> <b>C.I. CONSTITUTION NUMBER</b>
		Brownish black Redder and duller	<b>HUE</b> Daylight Artificial light (tungsten)
Slightly different chemically from C.I. Acid Black 26:2 but similar in properties and uses	The dyes listed under this C.I. Generic Name have constitution C.I. 27070, C.I. 27075 or C.I. 26690 Their properties and uses are the same as those of C.I. Acid Black 26	2  Moderate — Nylon— <i>d</i> , silk, cellulose and acetate— <i>hs</i>	<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres
			<b>DYEING: OTHER FIBRES</b>
			<b>PRINTING</b>
		AATCC  4-5 4 — — —  5 —  1-2 — — —  2-3 — 3-4 — —  2 — 1 2 —	<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{8}$ - $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
		Moderate Redder and duller — Redder and duller	<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron
			<b>NON-TEXTILE USAGE</b>
			<b>NOTES</b>

C.I. Acid Black	28	29	30
CHEMICAL CLASS	Disazo	Trisazo	Disazo
C.I. CONSTITUTION NUMBER	20500	—	—
HUE Daylight Artificial light (tungsten)	Bluish black Bluer	Black Somewhat greener	Black Little change
DYEING: WOOL Method	2, 3	1, 2	1, 2
Levelling S.D.C. migration test method/grade Staining other fibres	Poor — Silk, cellulose and acetate— ss	— — Acetate—s, cellulose—hs	— — Silk—hs, cellulose and acetate—ss
DYEING: OTHER FIBRES		Silk: neutral or acetic acid	
PRINTING	Direct on silk	Direct on wool and silk	
FASTNESS PROPERTIES Method	ISO	ISO	ISO
Alkali	4-5	5	5
Carbonising	4	5	5
Chlorination — alteration	—	4-5	2-3
staining wool	—	—	—
Decatising	4	4-5	3
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal	—	—	—
normal	5	3	6-7
2 × normal	—	—	—
Milling, alkaline — alteration	2	3-4	3
staining wool	—	3-4	2-3
Milling, acid — alteration	—	—	—
staining wool	—	—	—
Peroxide bleaching — alteration	—	4-5	—
staining wool	—	3	—
Perspiration	3	4-5	4-5
Potting — alteration	—	—	—
staining wool	—	—	—
Sea water — alteration	2	3-4	4-5
staining wool	—	—	—
Stoving	4	4-5	2
Washing — alteration	3	3-4	4-5
staining wool	—	4-5	5
OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron	Moderate Slightly weaker — Little change	Poor — — —	Poor — — —
NON-TEXTILE USAGE	Feathers Furs Inks	See Leather Dyes section	
NOTES		Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—reddish blue	

31	32	33	C.I. Acid Black
Monoazo 17580	Disazo 26990	— —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Bluish black Slightly redder and duller	Greenish black Redder and brighter	Black —	HUE Daylight Artificial light (tungsten)
1, 2 Moderate to good Cellulose and acetate—ss	2 Fair Cellulose and acetate—ss	2 Moderate — —	DYEING: WOOL Method Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: formic acid Silk: acetic acid or broken degumming liquor	Nylon: formic acid Silk: acetic acid		DYEING: OTHER FIBRES
			PRINTING
AATCC      ISO	AATCC      ISO	ISO	FASTNESS PROPERTIES Method
3 4 — — —	4-5 5 — — 5	4 4 — — 4	Alkali Carbonising Chlorination — alteration staining wool Decatising
— 6 —	— 6 —	— 7 —	Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal
3-4 — — —	3 4 — —	2 4 2-3 —	Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool
1 — 4-5 — —	2 — 4 — —	— — 3 — —	Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool
4-5 — 3-4 3-4 3-4	4-5 — 4 3 3	4-5 — 2-3 3 3	Sea water — alteration staining wool Stoving Washing — alteration staining wool
Poor to moderate Slightly redder — Slightly redder	Moderate Unaffected — Weaker and duller		OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
Paper coating See Leather Dyes section	See Leather Dyes section		NON-TEXTILE USAGE
Fastness on silk similar to that on wool but the fast- ness to perspiration is some- what lower			NOTES

# C.I. Acid Black 34—39

C.I. Acid Black	34	35	36
CHEMICAL CLASS	Monoazo	Disazo	Disazo
C.I. CONSTITUTION NUMBER	15715	26320	27275
HUE Daylight Artificial light (tungsten)	Bluish grey Slightly redder	Reddish black Redder and duller	Dull greyish black —
DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres	1, 2  Moderate — Cellulose and acetate—ss	1, 2  Good — Cellulose and acetate—ss	2  Moderate — Cellulose and acetate—u
DYEING: OTHER FIBRES	Silk: formic or sulphuric acid; wet fastness properties are im- proved by a tannic acid-tartar emetic treatment	Nylon: formic acid Silk: acetic acid	Silk: acetic acid
PRINTING	Direct on wool and silk		
FASTNESS PROPERTIES Method	ISO	AATCC	ISO
Alkali	3-4	5	4
Carbonising	4	4	4
Chlorination — alteration	—	—	—
staining wool	—	—	—
Decatising	4	3	—
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal	4	—	—
normal	4-5	6	6
2 × normal	5	—	—
Milling, alkaline — alteration	3-4	3-4	2-3
staining wool	—	—	—
Milling, acid — alteration	—	—	3-4
staining wool	—	—	—
Peroxide bleaching — alteration	2-3	1	2-3
staining wool	—	—	—
Perspiration	4-5	2	1-2
Potting — alteration	3-4	—	—
staining wool	—	—	—
Sea water — alteration	4-5	1-2	3-4
staining wool	—	—	—
Stoving	4	4	2
Washing — alteration	4	3-4	2
staining wool	3-4	—	4
OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron	Moderate Slightly duller — Duller	Moderate Unchanged — Much duller	— Weaker — Redder and much weaker
NON-TEXTILE USAGE	See Leather Dyes section	Paper coating See Leather Dyes section	Casein plastics Paper Soaps Writing inks
NOTES	Fastness to perspiration and washing is rather lower on silk than on wool		Fastness properties on silk are similar to those on wool



37	38	39	C.I. Acid Black	
Disazo —	Polyazo —	— —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER	
Black Little change	Black —	Greenish grey Little change	HUE Daylight Artificial light (tungsten)	
2  Moderate — Cellulose and acetate— <i>ss</i>	2  Moderate — Cellulose and acetate— <i>ss</i>	1, 2  Moderate to good — Acetate— <i>s</i> , cellulose— <i>vss</i>	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres	
Silk: acetic acid	Silk: acetic acid	Silk: neutral or acetic acid	DYEING: OTHER FIBRES	
Direct on wool and silk			PRINTING	
ISO 4-5 5 — 4-5  — 4 —  3 — — —  — 4 — 4 3-4 —	ISO 5 5 5 — 3 4 4 — 3-4 — 4 — 2-3 — 3 1 — 5 — 2-3 3-4 4	AATCC — 4 — — —  — 3 —  — — — — 5 — — 4-5 —	ISO 5 4 — — —  3 4 4-5 — — — — 5 4 — — 1 5 5	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{8}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Good Slight effect — Moderate change	Poor No effect — No effect	Poor Little change — Duller	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron	
			NON-TEXTILE USAGE	
Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—violet	Main use is hat dyeing Fastness properties on silk are a little lower than on wool		NOTES	

# C.I. Acid Black 40—45

C.I. Acid Black	40	41	42
CHEMICAL CLASS	—	Disazo	—
C.I. CONSTITUTION NUMBER	—	20480	—
HUE Daylight Artificial light (tungsten)	Black Redder	Bluish black Little change	Bluish black —
DYEING: WOOL Method	1, 2	3	
Levelling S.D.C. migration test method/grade Staining other fibres	Moderate — Cellulose and acetate— <i>u</i> , silk— <i>s</i>	— I/3 Nylon— <i>d</i> , silk— <i>d</i> (bluish), cellulose and acetate— <i>u</i>	
DYEING: OTHER FIBRES			
PRINTING			
FASTNESS PROPERTIES Method	ISO	AATCC	ISO
Alkali	5	4	4
Carbonising	5	5	4-5
Chlorination — alteration	—	—	—
staining wool	—	—	—
Decatising	5	—	4-5
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal	—	—	—
normal	6	6-7	5
2 × normal	—	—	—
Milling, alkaline — alteration	5	1	1-2
staining wool	4-5	1	1
Milling, acid — alteration	5	—	3
staining wool	5	—	—
Peroxide bleaching — alteration	—	—	2
staining wool	—	—	—
Perspiration	4	1	1-2
Potting — alteration	—	—	1-2
staining wool	—	—	—
Sea water — alteration	—	3	2-3
staining wool	—	—	—
Stoving	5	3	4-5
Washing — alteration	4-5	2	2
staining wool	4	1	4-5
OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron	Poor Slightly duller — —	Moderate Little change — Slightly weaker and bluer	
NON-TEXTILE USAGE		See Leather Dyes section Wood stains Writing inks	See Leather Dyes section
NOTES			

43	44	45	C.I. Acid Black
Monoazo (metallised) 15691	— —	— —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Reddish black Slightly redder	Bluish grey Greener and duller	Bluish black —	HUE Daylight Artificial light (tungsten)
3 — Moderate to good Cellulose and acetate— <i>vss</i>	1 — Good Cellulose and acetate— <i>ss</i>		DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Silk: broken degumming liquor	Nylon: as wool Silk: as wool or broken degumming liquor		DYEING: OTHER FIBRES
Direct and discharge styles on wool			PRINTING
ISO 4 4-5 4 — 4-5  — 7-8 — 3-4 — 4 4-5  3 — 4-5 3 3  4-5 — 4 3-4 3-4	ISO 4-5 4 4-5 — 4-5  5-6 6-7 7  4 5 2-3 2-3  4 4-5 5 — —  5 — 4-5 5 5		FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Dischargeable to white Redder Little change Slightly redder	Moderate to good Slightly greener and duller Little effect Slightly greener and duller		OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
See Leather Dyes section		Leather: on vegetable, chrome and semichrome tannages Gloving and suède leathers Suitable for brush staining of leather	NON-TEXTILE USAGE
	May be dyed acid, meta-chrome or afterchrome, the dyeing method having little effect on the fastness properties		NOTES

**C.I. Acid Black 46—50**

C.I. Acid Black	46	47	48			
CHEMICAL CLASS	Anthraquinone	Aminoketone	Anthraquinone			
C.I. CONSTITUTION NUMBER	—	56055	65005			
HUE Daylight Artificial light (tungsten)	Reddish grey Slightly redder and duller	Bluish grey Little change	Bluish grey→greenish navy Greener and duller			
DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres	1, 2  — IV/1 Cellulose and acetate—ss	2  Moderate — Cellulose and acetate—ss	2  Moderate — Cellulose and acetate—s			
DYEING: OTHER FIBRES	Silk: neutral or acetic acid	Silk: broken degumming liquor, neutral or acetic acid	Nylon: acetic or formic acid Silk: neutral or acetic acid			
PRINTING		Direct on wool, silk, nylon and viscose	Direct on wool, silk and viscose			
FASTNESS PROPERTIES Method	AATCC	ISO	AATCC	ISO		
Alkali	5	5	—	4-5	3	4-5
Carbonising	5	4	4	4	4-5	5
Chlorination — alteration	3-4	3	—	4-5	—	3
staining wool	—	—	—	—	—	—
Decatising	4-5	4-5	—	5	4	5
Light, ¼-½ normal	5	5-6	—	4	6	6
normal	5-6	6-7	3	4-5	6-7	6-7
2 × normal	5-6	7	—	4-5	7	7
Milling, alkaline — alteration	4	3-4	—	3-4	3	3
staining wool	4	4-5	—	4-5	—	—
Milling, acid — alteration	—	3-4	—	2	—	4
staining wool	—	—	—	—	—	—
Peroxide bleaching — alteration	—	—	—	5	3	3
staining wool	—	—	—	—	—	—
Perspiration	4-5	5	5	4	3	4
Potting — alteration	—	—	—	—	3	2-3
staining wool	—	—	—	—	—	—
Sea water — alteration	5	5	4	4	5	4
staining wool	—	—	—	—	—	—
Stoving	4-5	5	—	5	5	4-5
Washing — alteration	4-5	4-5	4-5	3-4	4	3
staining wool	4-5	5	4-5	5	4	3
OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron	Poor No change No change Slightly duller	Poor Unchanged Unchanged Duller	Poor Unchanged Unchanged Duller	Poor Slightly redder — Slightly duller and greener		
NON-TEXTILE USAGE		See Leather Dyes section	See Leather Dyes section			
NOTES	Wet fastness properties on silk are a little lower than on wool	Fastness on silk is generally similar to that on wool but fastness to washing is a little lower	Applicable afterchrome or metachrome to give slightly better wet fastness Fastness to light and wet processes on nylon is very good Fastness to washing on silk is much lower than on wool			



48:1	49	50	C.I. Acid Black
Anthraquinone —	Monoazo (metallised) —	Anthraquinone —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Bluish grey→greenish navy —	Greenish grey→greenish black Slightly redder	Bluish grey Somewhat redder	HUE Daylight Artificial light (tungsten)
Slightly chemically different from C.I. Acid Black 48 but similar in properties and uses	3 Moderate Silk— <i>hs</i> , cellulose— <i>ss</i> , acetate — <i>u</i>	2 III/2-3 Cellulose and acetate— <i>ss</i>	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
		Silk: broken degum- ming liquor or neutral	DYEING: OTHER FIBRES
	Direct on wool and silk	Direct on wool and silk	PRINTING
	ISO 4 5 — 5 — — 6-7 3 — — — 3 3 — 3-4 — 5 3-4 —	AATCC      ISO 5              4-5 4-5            4-5 —              2 —              5 3-4            3-4 4              4-5 4              4-5 4-5            5 2-3            2 2-3            2 —              2-3 —              2-3 —              1 —              1 4-5            4-5 —              1 —              1 4              4 4              4 4              3 4-5            4-5 4-5            4-5	FASTNESS PROPERTIES Method Alkali Carbonising Chlorination — alteration staining wool Decatising Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool Sea water — alteration staining wool Stoving Washing — alteration staining wool
	Poor Slight change Little change Slight change	Poor Little change Little change Duller	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
	Leather	See Leather Dyes section	NON-TEXTILE USAGE
	Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—violet	Fastness on silk is simi- lar to that on wool, but fastness to water and perspiration is lower  Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—brown	NOTES

### C.I. Acid Black 51—55

C.I. Acid Black	51	52	52:1
<b>CHEMICAL CLASS</b>	Monoazo (metallised)	Monoazo (metallised)	Monoazo (metallised)
<b>C.I. CONSTITUTION NUMBER</b>	16711	15711	—
<b>HUE</b> Daylight Artificial light (tungsten)	Black Little change	Black Slightly redder	Black —
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	3  Good — Cellulose and acetate— <i>u</i>	3  Good — Cellulose and acetate— <i>ss</i>	Slightly different chemically from C.I. Acid Black 52 but similar in properties and uses
<b>DYEING: OTHER FIBRES</b>	Silk: acetic acid or broken degumming liquor	Nylon: formic acid Silk: acetic or formic acid or broken degumming liquor	
<b>PRINTING</b>		Direct on wool and silk	
<b>FASTNESS PROPERTIES</b> Method	ISO	AATCC	ISO
Alkali	5	4	4
Carbonising	4-5	5	4-5
Chlorination — alteration	4	—	3-4
staining wool	—	—	—
Decatising	4	—	4-5
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal	5	5	6
normal	5	7	6-7
2 × normal	5-6	8	7
Milling, alkaline — alteration	3	2-3	4
staining wool	4-5	—	—
Milling, acid — alteration	4	—	4-5
staining wool	4	—	—
Peroxide bleaching — alteration	1-2	3	4
staining wool	5	—	—
Perspiration	3	4-5	4-5
Potting — alteration	4	—	3-4
staining wool	4	—	—
Sea water — alteration	5	5	4-5
staining wool	—	—	—
Stoving	5	4	4-5
Washing — alteration	4	3-4	4
staining wool	5	3-4	4
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Moderate Weaker — Weaker	Poor Redder Little change Redder	
<b>NON-TEXTILE USAGE</b>	See Leather Dyes section	See Leather Dyes section Anodised aluminium Aminoplasts	
<b>NOTES</b>			



**C.I. Acid Black 56—60:1**

<b>C.I. Acid Black</b>	<b>56</b>	<b>57</b>	<b>58</b>
<b>CHEMICAL CLASS</b>		Azo (metallised)	
<b>C.I. CONSTITUTION NUMBER</b>			
<b>HUE</b> Daylight Artificial light (tungsten)	Grey→bluish black	Bluish grey Much redder	Bluish grey Greener and duller
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres		3  Moderate — Cellulose—s, acetate—u	1, 2  Initial strike level, migration poor — Cellulose—ss, acetate—u
<b>DYEING: OTHER FIBRES</b>		Silk: neutral or acetic acid	Nylon: neutral or slightly alk- aline Silk: neutral or weakly acid
<b>PRINTING</b>		Direct on wool and silk	Direct on wool, silk and nylon Vigoureux printing
<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool		ISO  3-4 5 — — 5  5 5-6 6-7 4-5 — — — — 5 3-4 — 5 — 4-5 —	AATCC Wool    Nylon    ISO Wool —        —        4 4-5      —        4 —        5*       4 —        —        — 5        —        5  —        —        5-6 6-7      6       6-7 —        —        7  —        —        4-5 —        —        5 —        —        — —        —        3  —        —        5 —        —        — 5        4-5      5 5        —        5 —        —        4 5        5†      4-5 5        —        5
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron		Good Appreciable change — Slight change	Good Unchanged Unchanged Duller
<b>NON-TEXTILE USAGE</b>	Writing ink. Good sol- ubility and no deposit in presence of maximum amounts of iron and galls		See Leather Dyes section
<b>NOTES</b>		<b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—blue	*Chlorinated water †120°F.



59	60	60:1	C.I. Acid Black
	Monoazo (1:2 chromium complex) <b>18165</b>	—	<b>CHEMICAL CLASS</b> <b>C.I. CONSTITUTION NUMBER</b>
<b>Black</b> —	Bluish grey Redder	Bluish grey —	<b>HUE</b> Daylight Artificial light (tungsten)
	1, 2 Initial strike level, migration poor Acetate—s, cellulose—ss	Slightly different chemically from C.I. Acid Black 60 but similar in properties and uses	<b>DYEING: WOOL</b> Method Levelling S.D.C. migration test method/grade Staining other fibres
	Nylon: aqueous dyebath with careful control of temp.; exhaust with ammonium acetate Silk: neutral or slightly acid		<b>DYEING: OTHER FIBRES</b>
	Direct on wool, silk and nylon Vigoureux printing		<b>PRINTING</b>
	ISO 5 4-5 5 5 5 5-6 6-7 6-7 4 5 4 5 4 5 5 3 2 5 5 4-5 4-5 5		<b>FASTNESS PROPERTIES</b> Method Alkali Carbonising Chlorination — alteration staining wool Decatising Light, $\frac{1}{2}$ - $\frac{1}{2}$ normal normal 2 × normal Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool Sea water — alteration staining wool Stoving Washing — alteration staining wool
	Moderate Little change Little change Slight change		<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron
Leather: on vegetable, chrome and semi-chrome tannages	See Leather Dyes section		<b>NON-TEXTILE USAGE</b>
	Can be used with metachrome dyes		<b>NOTES</b>

# C.I. Acid Black 61—65

C.I. Acid Black	61	62	62:1
<b>CHEMICAL CLASS</b>			
<b>C.I. CONSTITUTION NUMBER</b>			
<b>HUE</b> Daylight Artificial light (tungsten)	Bluish grey Slightly greener	Greenish grey Somewhat greener	Greenish grey —
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres		1, 2  Initial strike level, migration poor — Acetate—s, cellulose—vss	Slightly different chemically from C.I. Acid Black 62 but very similar in properties and usage
<b>DYEING: OTHER FIBRES</b>	Nylon: ammonia; exhaust with ammonium sulphate. Wool—hs, cellulose—ss	Nylon: neutral with careful control of temp.; exhaust with ammonium acetate Silk: neutral or slightly acid	
<b>PRINTING</b>	Direct on nylon	Direct on wool, silk and nylon Vigoureux printing	
<b>FASTNESS PROPERTIES</b> Method	ISO Perlon	ISO	
Alkali	5	5	
Carbonising	5	4-5	
Chlorination — alteration	5	5	
staining wool	—	5	
Decatising	5	5	
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	6	6	
normal	6-7	6-7	
2 × normal	7	7	
Milling, alkaline — alteration	5	4	
staining wool	5	5	
Milling, acid — alteration	4	4	
staining wool	4	5	
Peroxide bleaching — alteration	4-5	3	
staining wool	—	5	
Perspiration	5	5	
Potting — alteration	4-5	3-4	
staining wool	3-4	3	
Sea water — alteration	5	4-5	
staining wool	5	5	
Stoving	5	5	
Washing — alteration	5	4-5	
staining wool	5	4-5	
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	Good Unchanged — Unchanged	Moderate Little change Little change Slight change	
<b>NON-TEXTILE USAGE</b>		See Leather Dyes section	
<b>NOTES</b>			

63	64	65	C.I. Acid Black
Monoazo (metallised) 12195		Monoazo (metallised)	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Black Slightly redder	Greenish grey Greener and duller		HUE Daylight Artificial light (tungsten)
	1, 2  Initial strike level, migration poor — Cellulose— <i>vss</i> , acetate— <i>u</i>		DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: ammonia; ex- haust with ammonium sulphate	Nylon: neutral or slightly alk- aline Silk: neutral or weakly acid		DYEING: OTHER FIBRES
Direct on nylon	Direct on wool, silk or nylon Vigoureux printing		PRINTING
ISO Perlon 5 5 5 — 4-5  — 7 —  4-5 4-5 4 3  3-4 — 5 4 2-3  5 5 5 5 4-5	ISO  4 4-5 3-4 — 5  5-6 6-7 7  4-5 5 — 4  — — 5 — 2-3  5 5 5 5 5		FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool  Decatising  Light, $\frac{1}{8}$ - $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Moderate to good Slightly changed — Unchanged	Poor Unchanged — Duller		OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
See C.I. Solvent Black 34		See Leather Dyes section	NON-TEXTILE USAGE
			NOTES

**C.I. Acid Black 66—72**

<b>C.I. Acid Black</b>	<b>66</b>	<b>67-68</b>	<b>69</b>
<b>CHEMICAL CLASS</b>	Trisazo		
<b>C.I. CONSTITUTION NUMBER</b>	30275		30260
<b>HUE</b> Daylight Artificial light (tungsten)			
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres			
<b>DYEING: OTHER FIBRES</b>			
<b>PRINTING</b>			
<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool			
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron			
<b>NON-TEXTILE USAGE</b>	See Leather Dyes section	See Leather Dyes section	See Leather Dyes section
<b>NOTES</b>			



70	71	72	C.I. Acid Black
30355	Monoazo (metallised)		CHEMICAL CLASS C.I. CONSTITUTION NUMBER
			HUE Daylight Artificial light (tungsten)
		This C.I. Generic Name is discontinued. The dyes formerly listed under it now appear under C.I. Acid Black 47	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
			DYEING: OTHER FIBRES
			PRINTING
			FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{8}$ - $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
			OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
See Leather Dyes section	See Leather Dyes section		NON-TEXTILE USAGE
			NOTES

**C.I. Acid Black 73—80**

<b>C.I. Acid Black</b>	<b>73</b>	<b>74</b>	<b>75</b>
<b>CHEMICAL CLASS</b>	Polyazo	—	Trisazo
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)			
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres			
<b>DYEING: OTHER FIBRES</b>			
<b>PRINTING</b>			
<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool			
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron			
<b>NON-TEXTILE USAGE</b>	See Leather Dyes section	Leather: vegetable, chrome and semi-chrome tannages. Bookbinding, clothing, gloving, shoe-upper and suède leathers. Brush staining On chrome tannage (ISO): Light 4–5, Penetration 3	See Leather Dyes section
<b>NOTES</b>			

76	77-79	80	C.I. Acid Black
Polyazo —	— —	Azo —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Brownish grey		Reddish black	HUE Daylight Artificial light (tungsten)
		2, 3 Migration good	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
			DYEING: OTHER FIBRES
			PRINTING
		ISO  5 5 — 5  — 7 —  5 3-4 — —  — 5 3 —  5 — 4 5 5	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ - $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
			OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
See Leather Dyes section	See Leather Dyes section	Leather: vegetable, chrome and semi-chrome tannages. On chrome tannage (ISO): Light 5, Penetration 1	NON-TEXTILE USAGE
Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—dull bluish green			NOTES

**C.I. Acid Black 81—86**

<b>C.I. Acid Black</b>	<b>81</b>	<b>82</b>	<b>83</b>
<b>CHEMICAL CLASS</b>	—	Disazo (metallised)	—
<b>C.I. CONSTITUTION NUMBER</b>	—	20265	—
<b>HUE</b> Daylight Artificial light (tungsten)			Bluish grey
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres			
<b>DYEING: OTHER FIBRES</b>			
<b>PRINTING</b>			
<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool			
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron			
<b>NON-TEXTILE USAGE</b>	Leather: vegetable, chrome and semi-chrome tannages On chrome tannage (ISO): Light 4, Penetration 1	See Leather Dyes section	See Leather Dyes section
<b>NOTES</b>			



<b>84</b>	<b>85</b>	<b>86</b>	<b>C.I. Acid Black</b>
Monoazo (metallised) <b>17560</b>	Azo —	Polyazo —	<b>CHEMICAL CLASS</b> <b>C.I. CONSTITUTION NUMBER</b>
Grey	Greenish black	Bluish black	<b>HUE</b> Daylight Artificial light (tungsten)
			<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres
			<b>DYEING: OTHER FIBRES</b>
			<b>PRINTING</b>
			<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ – $\frac{1}{4}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
			<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron
See Leather Dyes section	See Leather Dyes section	See Leather Dyes section	<b>NON-TEXTILE USAGE</b>
	Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—blue	Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—bluish black	<b>NOTES</b>

**C.I. Acid Black 87—94**

<b>C.I. Acid Black</b>	<b>87</b>	<b>88</b>	<b>89-91</b>
<b>CHEMICAL CLASS</b>	Trisazo	Polyazo	—
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Reddish black —	Reddish black —	
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres			
<b>DYEING: OTHER FIBRES</b>			
<b>PRINTING</b>			
<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool			
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron			
<b>NON-TEXTILE USAGE</b>	See Leather Dyes section	See Leather Dyes section	C.I. Acid Black 89, 90: See Leather Dyes section C.I. Acid Black 91: Leather: vegetable, chrome and semi- chrome tannages On chrome tannage (ISO): Light 3, Penetration 1
<b>NOTES</b>	<b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—violet	<b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—bluish black	

92	93	94	C.I. Acid Black
Azo (metallised) —	Tetrakisazo 35075	Trisazo 30336	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Bluish grey —			HUE Daylight Artificial light (tungsten)
			DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
			DYEING: OTHER FIBRES
			PRINTING
			FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
			OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
See Leather Dyes section	See Leather Dyes section	See Leather Dyes section	NON-TEXTILE USAGE
Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—brown		Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—dull violet	NOTES

**C.I. Acid Black 94:1—99**

<b>C.I. Acid Black</b>	<b>94:1</b>	<b>95</b>	<b>96</b>
<b>CHEMICAL CLASS</b>	—	Polyazo	Polyazo
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)		Greenish black —	Greenish black —
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	Slightly different chemically from C.I. Acid Black 94 but similar in properties and usage		
<b>DYEING: OTHER FIBRES</b>			
<b>PRINTING</b>			
<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool			
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron			
<b>NON-TEXTILE USAGE</b>		See Leather Dyes section	See Leather Dyes section
<b>NOTES</b>		Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—dull purple	Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—bluish black



97	98	99	C.I. Acid Black
Antraquinone 65008	Monoazo (metallised) —	Monoazo (1 : 2 metal complex) —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Greenish grey —	Bluish grey Slightly redder	Bluish grey Unchanged	HUE Daylight Artificial light (tungsten)
	1, 2  Initial strike level, migration poor — Cotton—ss, acetate—s	1, 2  Initial strike level, migration poor — Acetate and cellulose—s	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
	Nylon: neutral to slightly alkaline Silk: neutral or acetic acid	Nylon: neutral or slightly alkaline Silk: slightly acid	DYEING: OTHER FIBRES
		Direct on wool, silk and nylon	PRINTING
	ISO  3-4 4-5 3-4 — 4  5 5-6 6-7  4-5 — 4 —  — 5 1 —  5 — 4-5 4-5 —	ISO  4-5 4-5 4-5 5 4  5-6 6 6-7  4 3-4 3 3  — — 5 2-3 2  4-5 5 4 4 4-5	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ - $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
	Moderately affected Slightly affected Slightly affected		OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
			NON-TEXTILE USAGE
	Slow and uniform strike results in level dyeings on 'tippy' wool or on blends of different qualities of wool Fastness on silk is similar to that on wool  <b>Literature</b> Fran, FP 1129702, 1161640		NOTES

**C.I. Acid Black 100—107**

<b>C.I. Acid Black</b>	<b>100</b>	<b>101</b>	<b>102-104</b>
<b>CHEMICAL CLASS</b>		Metal complex	
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)		Bluish grey Unchanged	
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres		1, 2  Good — Acetate— <i>vs</i> s, cellulose— <i>ss</i>	
<b>DYEING: OTHER FIBRES</b>	This C.I. Generic Name is discontinued	Nylon: slightly alkaline Silk: acetic acid	
<b>PRINTING</b>			
<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool		ISO  3-4 5 — 5  5-6 6 6-7  5 5 — —  — — 5 3-4 3  5 5 4 5 5	
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron		— Unaffected — Unaffected	
<b>NON-TEXTILE USAGE</b>			See Leather Dyes section
<b>NOTES</b>			

105	106	107	C.I. Acid Black
— —	Azo —	Monoazo (1 : 2 metal complex) —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Black —	Grey —	Brownish black —	HUE Daylight Artificial light (tungsten)
		1, 2  Moderate — —	DYEING: WOOL Method  Levelling. S.D.C. migration test method/grade Staining other fibres
Cow hair Hog bristles Horse hair		Silk: neutral or weakly acid Nylon	DYEING: OTHER FIBRES
			PRINTING
		ISO  5 4-5 4-5 — 4 (redder)  — 7-8 —  5 4-5 5 3-4  4-5 (redder) 3-4 5 4-5 1  5 5 4-5 5 4-5	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool  Decatising  Light, $\frac{1}{2}$ - $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
		2 (as grey) — — —	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
Inks		See Leather Dyes section	NON-TEXTILE USAGE
		Fastness on silk (ISO): Light 6-7; Sea water 5, 3; Washing 5, 2-3	NOTES

**C.I. Acid Black 108—113**

<b>C.I. Acid Black</b>	<b>108</b>	<b>109</b>	<b>110</b>
<b>CHEMICAL CLASS</b>	Monoazo (1 : 2 metal complex)	Azo	Azo
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Greenish black —	Black Redder	Reddish black —
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	1, 2  Moderate — Cellulose and acetate—ss	2  Moderate — Cellulose—hs, acetate—ss	2  Moderate — Cellulose—hs, acetate—ss
<b>DYEING: OTHER FIBRES</b>	Silk: neutral or weakly acid Nylon	Nylon and silk: neutral or acetic acid	Nylon and silk: neutral or acetic acid
<b>PRINTING</b>		Direct on wool, silk and nylon	Direct on wool, silk and nylon
<b>FASTNESS PROPERTIES</b> Method	ISO	ISO	ISO
Alkali	5	4-5	3
Carbonising	5	—	—
Chlorination — alteration	4-5	—	—
staining wool	—	—	—
Decatising	5	—	—
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	—	—	—
normal	7-8	6-7	6
2 × normal	—	—	—
Milling, alkaline — alteration	5	—	—
staining wool	4	—	—
Milling, acid — alteration	5	—	—
staining wool	3-4	—	—
Peroxide bleaching — alteration	5	—	—
staining wool	3-4	—	—
Perspiration	5	4-5	4-5
Potting — alteration	4	4-5	4-5
staining wool	1	—	2
Sea water — alteration	5	4-5	4-5
staining wool	5	3	2-3
Stoving	5	—	—
Washing — alteration	5	4-5	4-5
staining wool	4	4-5	3-4
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron	2 — — —	Poor Little change Slight change Duller	Poor Slight change Slight change Duller
<b>NON-TEXTILE USAGE</b>	See Leather Dyes section	See Leather Dyes section	
<b>NOTES</b>	Fastness on silk (ISO): Light 6-7; Washing 5, 4-5	<b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—reddish vio- let; on diln—black ppt.  Fastness on silk similar to that on wool	Fastness on silk similar to that on wool  <b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—reddish vio- let; on diln—black ppt



<b>111</b>	<b>112</b>	<b>113</b>	<b>C.I. Acid Black</b>
Azo —	— —	Azo —	<b>CHEMICAL CLASS</b> <b>C.I. CONSTITUTION NUMBER</b>
— —	Bluish grey —	Black —	<b>HUE</b> Daylight Artificial light (tungsten)
		1, 2  Good — Viscose—ss, acetate and cotton—s	<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres
The dyes formerly listed under this C.I. Generic Name now appear under C.I. Acid Black 109		Nylon and silk: ammonium acetate or sulphate	<b>DYEING: OTHER FIBRES</b>
			<b>PRINTING</b>
		ISO*  5 4 4-5 — 5  — 7-8 8  4-5 5 — —  — — 5 — —  5 5 5 4-5 5	<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
			<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron
		See Leather Dyes section	<b>NON-TEXTILE USAGE</b>
		*AATCC fastness to light—normal 6, 2 × normal 7-8	<b>NOTES</b>

**C.I. Acid Black 114—122**

<b>C.I. Acid Black</b>	<b>114</b>	<b>115</b>	<b>116</b>
<b>CHEMICAL CLASS</b>	Monoazo (1:2 metal complex)	Monoazo (1:2 metal complex)	—
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Bluish grey —	— —	
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	1, 2  Good — Viscose— <i>u</i> , cotton— <i>ss</i> , acetate— <i>s</i>	1, 2  Good — Viscose— <i>u</i> , cotton— <i>ss</i> , acetate— <i>s</i>	This C.I. Generic Name is discontinued
<b>DYEING: OTHER FIBRES</b>	Nylon and silk: ammonium acetate or sulphate	Nylon and silk: ammonium acetate or sulphate	
<b>PRINTING</b>			
<b>FASTNESS PROPERTIES</b> Method	ISO*	ISO*	
Alkali	5	5	
Carbonising	4-5	5	
Chlorination — alteration	5	4-5	
staining wool	—	—	
Decatising	5	5	
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	5-6	5-6	
normal	6-7	6-7	
2 × normal	7	7	
Milling, alkaline — alteration	4-5	4-5	
staining wool	5	5	
Milling, acid — alteration	—	—	
staining wool	—	—	
Peroxide bleaching — alteration	—	—	
staining wool	—	—	
Perspiration	5	5	
Potting — alteration	—	—	
staining wool	—	—	
Sea water — alteration	5	5	
staining wool	5	5	
Stoving	4-5	4-5	
Washing — alteration	4	4	
staining wool	5	5	
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron		4 — — —	
<b>NON-TEXTILE USAGE</b>	See Leather Dyes section	See Leather Dyes section	
<b>NOTES</b>	*AATCC: Fastness to light 5-6, 6, 7	*AATCC: Fastness to light 5-6, 6, 7	

117	118-120	121, 122	C.I. Acid Black
— —	Azo (metal complex) —	Azo (metal complex) —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
— —	Black —	Grey —	HUE Daylight Artificial light (tungsten)
This C.I. Generic Name is discontinued. The dyes formerly listed under it now appear under C.I. Acid Black 63			DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
			DYEING: OTHER FIBRES
			PRINTING
			FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ - $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
			OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
			NON-TEXTILE USAGE
			NOTES

**C.I. Acid Black 123—128**

<b>C.I. Acid Black</b>	<b>123</b>	<b>124</b>	<b>125</b>
<b>CHEMICAL CLASS</b>		Monoazo (1:2 metal complex)	—
<b>C.I. CONSTITUTION NUMBER</b>		15900	—
<b>HUE</b> Daylight Artificial light (tungsten)		Bluish grey —	
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	This C.I. Generic Name is discontinued. The dyes formerly listed under it now appear under C.I. Acid Black 63	1, 2  Poor, initial strike level — Acetate— <i>vss</i> , cellulose— <i>ss</i>	This C.I. Generic Name is discontinued. The dyes formerly listed under it now appear under C.I. Acid Black 77
<b>DYEING: OTHER FIBRES</b>		Nylon: neutral Silk: as wool	
<b>PRINTING</b>		Direct on wool, silk and nylon Vigoureux printing	
<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool		ISO  3-4 5 4 5 5  6-7 7 —  4-5 4-5 4-5 5  — — — 4-5 — — —  — — 5 4-5 4-5	
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron		Fairly good 5 Little effect 5	
<b>NON-TEXTILE USAGE</b>		See Leather Dyes section	
<b>NOTES</b>			



126	127	128	C.I. Acid Black
Trisazo —	— —	Monoazo —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Black —	Reddish grey —	Black —	HUE Daylight Artificial light (tungsten)
			DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
			DYEING: OTHER FIBRES
			PRINTING
			FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ – $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
			OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
See Leather Dyes section	See Leather Dyes section	Anodised aluminium: Fastness to light 8	NON-TEXTILE USAGE
			NOTES

**C.I. Acid Black 129—134**

<b>C.I. Acid Black</b>	<b>129</b>	<b>130</b>	<b>131</b>
<b>CHEMICAL CLASS</b>	Monoazo (1:2 metal complex)	Formazan (metal complex)	Azo (1:2 metal complex)
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Black Greener	Black Greener	Black Unchanged
<b>DYEING: WOOL</b> Method	1, 2	1, 2	1
Levelling	—	—	Good; can be salted at boil
S.D.C. migration test method/grade	—	—	—
Staining other fibres	—	—	Cotton and acetate— <i>hs</i>
<b>DYEING: OTHER FIBRES</b>	Nylon: ammonium sulphate and sodium phosphate Silk Jute Sisal	Nylon: ammonium sulphate and sodium phosphate Silk Jute Sisal	Nylon and silk: neutral; exhaust with ammonium sulphate
<b>PRINTING</b>	Direct on wool, silk and nylon	Direct on wool, silk and nylon	Direct on wool, silk and nylon
<b>FASTNESS PROPERTIES</b> Method	ISO	ISO	ISO
Alkali	4-5	4-5	5
Carbonising	4-5	4-5	4
Chlorination — alteration	4	4	3-4
staining wool	5	5	—
Decatising	5	4	5
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	5-6	6	—
normal	6-7	6-7	7-8
2 × normal	6-7	7	—
Milling, alkaline — alteration	4-5	4-5	5
staining wool	4-5	5	4
Milling, acid — alteration	3-4	4	2-3
staining wool	3-4	4-5	2
Peroxide bleaching — alteration	4-5	2	4-5
staining wool	5	4-5	3
Perspiration	5	4-5	5
Potting — alteration	3-4	4-5	4-5
staining wool	2	4	2-3
Sea water — alteration	5	4-5	5
staining wool	5	5	5
Stoving	4	4-5	2
Washing — alteration	4-5	4-5	5
staining wool	5	5	5
<b>OTHER PROPERTIES</b> Dischargeability	3-4	2-3	3
Effect of metals — copper	3-4 (duller)	4	5
chromium	—	—	Slightly greener
iron	4	4-5	4
<b>NON-TEXTILE USAGE</b>	See Leather Dyes section	See Leather Dyes section	See Leather Dyes section
<b>NOTES</b>			Fastness on silk: Light 6; Perspiration 4-5; Sea water 4; Washing 4-5 Fastness on nylon: Light 7; Perspiration 5; Alk milling 5; Washing 5

132	133	134	C.I. Acid Black
Azo (1 : 2 metal complex) —	Monoazo (metal complex) —	Azo (metallised) —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Black Redder	Bluish grey Slightly greener	Grey —	HUE Daylight Artificial light (tungsten)
1  Good; can be salted at boil — Acetate and cotton—hs	1, 2  Initial strike level, migration poor — Acetate and cotton—ss		DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon and silk: neutral; exhaust with ammonium sulphate	Nylon: slightly alkaline Silk: neutral or slightly acid		DYEING: OTHER FIBRES
Direct on wool, silk and nylon			PRINTING
ISO  5 4 3-4 — 5  — 7-8 —  5 4 2-3 2  4-5 3 5 4-5 2-3  5 5 2 5 5	ISO  4 4-5 — — 5  5-6 6 6-7  4-5 5 — —  4-5 4-5 4-5 2 2  5 5 4-5 4-5 5		FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ - $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
3 5 Little effect 4	Good Greener and duller Little effect Greener and duller		OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
See Leather Dyes section		See Leather Dyes sec- tion	NON-TEXTILE USAGE
Fastness on silk: Light 6; Perspiration 4-5; Sea water 4; Washing 4-5 Fastness on nylon: Light 7; Perspiration 5; Alk milling 5; Washing 5	Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—reddish violet; on diln—dull violet		NOTES

**C.I. Acid Black 135—140**

<b>C.I. Acid Black</b>	<b>135</b>	<b>136</b>	<b>137</b>
<b>CHEMICAL CLASS</b>	Azo (1:2 metal complex)	Azo (1:2 metal complex)	Azo (1:2 metal complex)
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Bluish grey Redder	Grey Unchanged	Brownish grey —
<b>DYEING: WOOL</b> Method	1, 2	1, 2	1, 2
Levelling	—	Poor, but initial strike level	Poor; initial strike level
S.D.C. migration test method/grade	—	—	—
Staining other fibres	—	Acetate—ss, cellulose—s	Cellulose—u, acetate—ss
<b>DYEING: OTHER FIBRES</b>	Nylon Silk	Nylon: weakly alkaline Silk: acetic acid	Nylon: weakly alkaline Silk: acetic acid
<b>PRINTING</b>			
<b>FASTNESS PROPERTIES</b> Method	ISO	ISO	ISO
Alkali	4	4	4-5
Carbonising	5	5	4-5
Chlorination — alteration	—	5	5
staining wool	—	—	—
Decatising	5	5	5
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	5-6	5-6	6
normal	6	6-7	6
2 × normal	7	7	6-7
Milling, alkaline — alteration	5	4-5	4-5
staining wool	5	5	5
Milling, acid — alteration	4	4	4
staining wool	2	3-4	3
Peroxide bleaching — alteration	—	—	—
staining wool	—	—	—
Perspiration	5	5	5
Potting — alteration	—	—	4
staining wool	—	—	3
Sea water — alteration	5	5	5
staining wool	—	5	5
Stoving	—	—	—
Washing — alteration	4-5	4-5	4-5
staining wool	5	5	5
<b>OTHER PROPERTIES</b> Dischargeability	—	—	—
Effect of metals — copper	—	Slightly brighter	Redder
chromium	—	—	—
iron	Redder	Unaffected	Unaffected
<b>NON-TEXTILE USAGE</b>			
<b>NOTES</b>		Fastness on silk: Alkali 5; Light 4-5, 5, 5-6; Perspiration 4; Washing 4 Fastness on nylon: Alkali 5; Light 5, 6, 6-7; Perspiration 5; Washing 4-5	Fastness on silk: Alkali 4; Light 5, 5, 5-6; Perspiration 5; Washing 4-5 Fastness on nylon: Alkali 4-5; Light 7, 7-8, 7-8; Perspiration 5; Washing 4-5



138	139	140	C.I. Acid Black
Monoazo (1:2 metal complex) —	Monoazo (1:2 metal complex) —	Monoazo (1:2 metal complex) —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Black Slightly redder	Black Slightly redder	Grey Slightly redder	HUE Daylight Artificial light (tungsten)
1, 2  Good; can be salted at boil — Acetate, cellulose, polyester and acrylic—ss	1, 2  Good; can be salted at boil — Acetate, acrylic, cellulose and polyester—ss	1, 2  Good; can be salted at boil — Acetate, acrylic, cellulose and polyester—ss	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: acetic acid + Na <sub>3</sub> PO <sub>4</sub> + levelling agent	Nylon: acetic acid + Na <sub>3</sub> PO <sub>4</sub> + levelling agent	Nylon: acetic acid + Na <sub>3</sub> PO <sub>4</sub> + levelling agent	DYEING: OTHER FIBRES
Direct on wool, silk and nylon	Direct on wool, silk and nylon	Direct on wool, silk and nylon	PRINTING
ISO  4-5 5 4-5 3-4 4-5  — 7-8 —  5 4-5 4 2  4-5 3 5 3-4 1  5 5 5 4-5 4	ISO  4-5 5 4-5 3-4 4-5  — 7 —  4-5 4 4 (redder) 2  4-5 3 5 3-4 1  5 5 5 4-5 3	AATCC  4-5 4-5 4-5 4-5 4-5  5 6-7 7  5 4-5 — —  — — 5 — — 5 4-5 4  4-5 4 (greener, duller) 4-5 3-4 (greener, duller)	ISO  4 4-5 4-5 4-5 5  5-6 6-7 7  4-5 5 4 3-4  4-5 5 5 3-4 2  5 5 4-5 4-5 5  OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
See Leather Dyes section		See Leather Dyes section	NON-TEXTILE USAGE
Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—bluish violet; on diln—dull reddish violet	Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—bluish red	Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—navy; on diln—violet	NOTES

**C.I. Acid Black 141—148**

<b>C.I. Acid Black</b>	<b>141</b>	<b>142</b>	<b>143-145</b>
<b>CHEMICAL CLASS</b>	—		Azo
<b>C.I. CONSTITUTION NUMBER</b>	—		—
<b>HUE</b> Daylight Artificial light (tungsten)			— —
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	This C.I. Generic Name is discontinued	This C.I. Generic Name is discontinued. The dyes formerly listed under it now appear under C.I. Acid Black 107	
<b>DYEING: OTHER FIBRES</b>			
<b>PRINTING</b>			
<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool			
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron			
<b>NON-TEXTILE USAGE</b>			See Leather Dyes section
<b>NOTES</b>			

146	147	148	C.I. Acid Black
Azo —	Azo (metal complex) —	Monoazo (1 : 2 metal complex) —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
	Reddish black Unchanged	Bluish grey Redder, slightly duller	HUE Daylight Artificial light (tungsten)
This C.I. Generic Name is discontinued. The dyes formerly listed under it now appear under C.I. Mordant Black 80	2 Migration fair — Cellulose—ss, acetate—s	1, 2 Good but migration poor — Acetate, acrylic, cellulose and polyester—s	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
	Nylon and silk: formic acid	Nylon Silk	DYEING: OTHER FIBRES
	Direct on wool, silk and nylon	Direct on wool, silk and nylon	PRINTING
	ISO 5 5 5 5 5 — 7-8 — 5 5 4 2-3 — — 4-5 4-5 1-2 5 — 4 5 5	ISO 5 5 2-3 — 5 5-6 6-7 7 4-5 5 4 4-5 5 5 5 4 2-3 5 5 5 4-5 5	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ - $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
	— — Little change —	Dischargeable to white 4-5 4-5 4	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
			NON-TEXTILE USAGE
		Fastness on silk: Light 5, 5-6, 6-7; Washing 5 Fastness on nylon: Light 5-6, 6-7, 6-7; Washing 5	NOTES

**C.I. Acid Black 149—154**

<b>C.I. Acid Black</b>	<b>149</b>	<b>150</b>	<b>151</b>
<b>CHEMICAL CLASS</b>	Azo (metal complex)	Monoazo (1:2 metal complex)	Monoazo (1:2 metal complex)
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Reddish grey —	— —	Grey Greener and duller
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres		1, 2  Good — —	1, 2  Moderate — Cotton, acrylic and polyester— <i>vss</i> , viscose and acetate— <i>vss-u</i>
<b>DYEING: OTHER FIBRES</b>		Nylon: ammonium sulphate + trisodium phosphate or weakly acid Silk: weakly acid Coir, jute and sisal	Nylon: ammonium sulphate + Na <sub>3</sub> PO <sub>4</sub> Silk: neutral or weakly acid Jute, coir and sisal
<b>PRINTING</b>		Direct on wool, silk and nylon	Direct on wool, silk and nylon
<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool		ISO  4-5 4 4-5 4-5 4-5  5-6 6-7 6-7  5 4 4-5 2-3  4-5 3-4 5 4-5 1  5 5 4-5 5 5	ISO  4 3-4 4-5 5 4-5  5 6 6-7  4-5 4-5 4 3-4  4-5 4-5 5 4 2-3  5 5 3-4 4 4-5
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron		2-3 4-5 Unaffected 4-5	4 4 — 4
<b>NON-TEXTILE USAGE</b>	See Leather Dyes section		
<b>NOTES</b>		Solubility: 50 g/l	Solubility: 50 g/l at 80°C, 80 g/l at 100°C



152	153	154	C.I. Acid Black
— —	Azo (metallised) —	Monoazo (1:2 metal complex) —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Grey Duller	Bluish grey Greener and duller	Bluish grey —	HUE Daylight Artificial light (tungsten)
1, 2 — — Acetate and viscose —ss	1, 2 Good; can be salted at boil — Cellulose and acetate—ss Acrylic and polyester—s	1, 2 — — Acetate, acrylic, cellulose, polyester, triacetate—ss, silk—hs	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: neutral Silk: broken soap bath, ammonium acetate; exhaust with acetic acid	Nylon: neutral or ammoniacal Silk: neutral, levels well Bast fibres	Nylon: neutral; solid dyeings on wool-nylon mixtures and blends	DYEING: OTHER FIBRES
Direct on wool Vigoureux printing	Direct on wool, silk and nylon Vigoureux printing		PRINTING
ISO 5 3-4 4-5 5 5 6 6-7 7 4 5 4 4-5 4 5 5 2 2 5 5 5 4-5 5	ISO 5 4 5 — 4 5-6 6 6-7 4 5 4 4-5 4 4-5 4-5 4 5 4-5 3-4 1-2 5 5 4 4-5 5	ISO Wool 4-5 4-5 4-5 — 5 5-6 6-7 6-7 4-5 5 4-5 4-5 4-5 5 5 5 2-3 1 5 5 4-5 4-5 5	Nylon 3-4 — 3 — 4 5-6 6-7 6-7 5 5 — — — — — — — — — 5 5 3-4 5 5
3-4 2-3 2-3 2-3	Not dischargeable 4 4 4	Good 4 (redder) 3 (greener) 4 (greener)	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
			OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
			NON-TEXTILE USAGE
Solubility: 40 g/l	Fastness on nylon very similar to that on wool Solubility: 80 g/l  Reaction in substance H <sub>2</sub> SO <sub>4</sub> conc.—bluish red; on diln—dull violet	Solubility: 50 g/l at 85°C	NOTES

**C.I. Acid Black 155—161**

<b>C.I. Acid Black</b>	<b>155</b>	<b>156</b>	<b>157</b>
<b>CHEMICAL CLASS</b>	Azo (metallised)	Azo	Azo (metallised)
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Reddish black Redder	Bluish grey Greener and duller	Bluish black —
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres	1, 2  Good — Acetate, cellulose, acrylic, polyester— <i>u</i>	1, 2  Good — Cotton, acetate— <i>s</i> , acrylic, polyester, viscose— <i>ss</i>	1  Moderate to good — Cellulose and acetate— <i>s</i> Acrylic, nylon, silk— <i>d</i>
<b>DYEING: OTHER FIBRES</b>	Silk: neutral or weakly acid Nylon: careful temp. control necessary; exhaust with am- monium acetate	Nylon: careful temp. control needed; exhaust with am- monium acetate	Nylon: neutral
<b>PRINTING</b>	Direct on wool, silk and nylon Vigoureux printing	Direct on wool, silk and nylon Vigoureux printing	Direct on wool, silk and nylon
<b>FASTNESS PROPERTIES</b> Method	ISO	ISO	ISO
Alkali	5	5	5
Carbonising	—	—	—
Chlorination — alteration	—	—	—
staining wool	—	—	—
Decatising	5	4-5	—
Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal	—	5	—
normal	7	6	6
2 × normal	—	7	—
Milling, alkaline — alteration	4-5	5	4
staining wool	4-5	4-5	4
Milling, acid — alteration	—	—	—
staining wool	—	—	—
Peroxide bleaching — alteration	—	4-5	5
staining wool	—	5	3
Perspiration	5	5	4-5
Potting — alteration	4-5	5	4-5
staining wool	4-5	4	2
Sea water — alteration	5	5	4-5
staining wool	5	5	4
Stoving	—	—	—
Washing — alteration	4-5	5	4-5
staining wool	5	5	4
<b>OTHER PROPERTIES</b>			
Dischargeability	—	3-4	4
Effect of metals — copper	—	—	Unaffected
chromium	—	Little effect	—
iron	—	—	Slightly affected
<b>NON-TEXTILE USAGE</b>			
<b>NOTES</b>			Solubility: 30 g/l at 80°C

158	159	160, 161	C.I. Acid Black
Azo (metallised) —	Azo (metallised) —	Trisazo —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Brownish black —	Bluish black —	Black —	HUE Daylight Artificial light (tungsten)
1  Poor — Cotton—ss to s, viscose—hs, acetate—ss, acrylic—vhs, nylon and silk—d	1  Poor — Cotton and acetate—s, viscose—vhs, nylon and silk—d		DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: neutral	Nylon: neutral		DYEING: OTHER FIBRES
Direct on wool, silk and nylon	Direct on wool, silk and nylon		PRINTING
JIS 5 — — — — 7-8 — 4-5 4 — 5 4 4-5 4-5 3 5 4-5 — 4-5 4	JIS 5 — — — — 7-8 — 4-5 4 — 5 4 4-5 4-5 3 5 4-5 — 4-5 4		FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ - $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
4 Very slightly affected — Marked change	4 Very slightly affected — Marked change		OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
		See Leather Dyes section	NON-TEXTILE USAGE
Solubility: 30 g/l at 80°C	Solubility: 30 g/l at 80°C		NOTES

**C.I. Acid Black 162—167**

<b>C.I. Acid Black</b>	<b>162</b>	<b>163</b>	<b>164</b>
<b>CHEMICAL CLASS</b>	Naphthoquinoneimine	Naphthoquinone	Azo (metallised)
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Grey —	Grey —	Black Slightly redder
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres			1, 2  Moderate — Acetate, cellulose, polyester— hs
<b>DYEING: OTHER FIBRES</b>			Nylon: slightly acid to slightly alkaline Silk: neutral or acetic acid, levelling moderate
<b>PRINTING</b>			Direct on wool, silk, nylon and acetate
<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool			ISO  5 4 4 4-5 4-5  —* 7 —  4 4 4-5 3-4  4-5 4 4-5 4 2  5 5 — 4-5* 5
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron			3-4 Slightly weaker Slightly greener Slightly duller
<b>NON-TEXTILE USAGE</b>	See Leather Dyes section	See Leather Dyes section	
<b>NOTES</b>			*Fastness on silk: Light 6, Washing 3-4, 3 Solubility: 55 g/l  <b>Reaction in substance</b> H <sub>2</sub> SO <sub>4</sub> conc.—dark blue; on diln—dark violet + ppt





**C.I. Acid Black 168—173**

<b>C.I. Acid Black</b>	<b>168</b>	<b>169</b>	<b>170</b>
<b>CHEMICAL CLASS</b>	Azo (metal complex)	Trisazo	Azo (1:2 metal complex)
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Grey Redder	Black No change	Deep neutral grey Deeper, duller
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres			
<b>DYEING: OTHER FIBRES</b>			Nylon: acetic acid Cotton—/s, polyester—s
<b>PRINTING</b>			
<b>FASTNESS PROPERTIES</b> Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool			ISO  — — 5* — 5  — 7-8 —  — — — —  — — 4-5 — —  5 5 — 5 5†
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron			Poor — — —
<b>NON-TEXTILE USAGE</b>	See Leather Dyes section	See Leather Dyes section	See Leather Dyes section
<b>NOTES</b>			Not compatible with certain levelling agents *Chlorinated water †Staining nylon 4-5

171	172	173	C.I. Acid Black
Azo (metal complex) —	Monoazo (1:2 metal complex) —	Monoazo —	CHEMICAL CLASS C.I. CONSTITUTION NUMBER
Black Slightly greener	Black Redder	Grey Redder	HUE Daylight Artificial light (tungsten)
			DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon			DYEING: OTHER FIBRES
	Direct on wool, silk and nylon—good build-up on nylon		PRINTING
ISO — — 4-5* — — 7 — — — — — 4-5 — — 4-5 — 4 —	ISO† — — 5* — — 7 — — — — — 5 — — 5 — 4-5 —		FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
— 5 — 5			OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
		See Leather Dyes section	NON-TEXTILE USAGE
*Chlorinated water	*Chlorinated water †Fastness on nylon similar to that on wool but slightly better to washing Fastness on silk somewhat lower than on wool		NOTES

**C.I. Acid Black 174—179**

<b>C.I. Acid Black</b>	<b>174</b>	<b>175</b>	<b>176</b>
<b>CHEMICAL CLASS</b>	Azo (1:2 metal complex)	Azo	Azo (metal complex)
<b>C.I. CONSTITUTION NUMBER</b>	—	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Black (nylon) No change	Black (nylon) No change	Black —
<b>DYEING: WOOL</b> Method  Levelling S.D.C. migration test method/grade Staining other fibres			
<b>DYEING: OTHER FIBRES</b>	Nylon 6: neutral; exhaust with acetic acid Nylon 11: at high temp. using acetic and formic acid	Nylon Rayon	
<b>PRINTING</b>			
<b>FASTNESS PROPERTIES</b> Method	ISO	ISO	
		Nylon	Rayon
Alkali	4-5	—	—
Carbonising	—	—	—
Chlorination — alteration	5*	—	—
staining wool	—	—	—
Decatising	4-5	—	—
Light, $\frac{1}{3}$ — $\frac{1}{2}$ normal	—	—	—
normal	7	5-6	4-5
2 × normal	—	—	—
Milling, alkaline — alteration	4-5	—	—
staining wool	—	—	—
Milling, acid — alteration	—	—	—
staining wool	—	—	—
Peroxide bleaching — alteration	—	—	—
staining wool	—	—	—
Perspiration	4-5	—	—
Potting — alteration	—	—	—
staining wool	—	—	—
Sea water — alteration	4-5	—	—
staining wool	—	—	—
Stoving	—	—	—
Washing — alteration	4-5	4-5	4
staining wool	—	—	—
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron			
<b>NON-TEXTILE USAGE</b>			
<b>NOTES</b>	*Chlorinated water		



177	178	179	C.I. Acid Black
Monoazo (1 : 2 metal complex) —	Azo (metal complex) —	Monoazo (1 : 2 metal complex) —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Black —	Violet black —	Black Weaker	HUE Daylight Artificial light (tungsten)
			DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
		Nylon	DYEING: OTHER FIBRES
			PRINTING
		ISO — — 5* — 5  — 8 —  — — —  — — 5 — —  5 5 — 5 5	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ — $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
		2 — — —	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
	Leather: on chrome, suède and glove leathers. Penetration good. Fastness: acid 5, alkali 5, Solvents 5, light 6-7.		NON-TEXTILE USAGE
	Solubility 15 g/l	*Chlorinated water	NOTES

**C.I. Acid Black 180—185**

<b>C.I. Acid Black</b>	<b>180</b>	<b>181</b>	<b>182</b>
<b>CHEMICAL CLASS</b>	Azo (Formazan cobalt-complex)	Monoazo (1:2 metal complex)	Trisazo
<b>C.I. CONSTITUTION NUMBER</b>	13710	—	—
<b>HUE</b> Daylight Artificial light (tungsten)	Bluish grey —	Black —	Black —
<b>DYEING: WOOL</b> Method	1, 2	2	
Levelling S.D.C. migration test method/grade Staining other fibres	Good — Acetate and cellulose— <i>u</i> , acrylic and polyester— <i>ss</i> , silk— <i>hs</i>	4 — Acetate—3-4, acrylic—3, cotton —3-4, polyester—4	
<b>DYEING: OTHER FIBRES</b>	Nylon: neutral	Nylon: pH 6-7 (deep dyeings), 7-8 (pale dyeings) Silk: neutral or weakly acid	
<b>PRINTING</b>		Nylon, silk and wool: with urea + special assistant; steamed	
<b>FASTNESS PROPERTIES</b> Method	ISO	ISO Wool      ISO Nylon	
Alkali	—	4-5      4-5	
Carbonising	4-5	4-5*      5†	
Chlorination — alteration staining wool	— —	4-5      — —      —	
Decatising	—	4-5 (mild)      4-5 (mild)	
Light, $\frac{1}{2}$ — normal	—	—      —	
normal	6	6      6	
2 × normal	—	7      7	
Milling, alkaline — alteration staining wool	4 4	4-5      4-5 4      5	
Milling, acid — alteration staining wool	— —	4-5      5 4-5      5	
Peroxide bleaching — alteration staining wool	— —	4-5      4-5 3-4      2-3	
Perspiration	4-5	5†      5†	
Potting — alteration	—	4-5      —	
staining wool	—	1      —	
Sea water — alteration	—	5      5	
staining wool	—	5      5	
Stoving	—	—      —	
Washing — alteration	4	4-5(ISO 3)      5(ISO 3)	
staining wool	4-5	4-5      5	
<b>OTHER PROPERTIES</b> Dischargeability Effect of metals — copper chromium iron		3 (wool), 2 (nylon 6-6) 4 (redder) 3-4 (yellower) 4-5	
<b>NON-TEXTILE USAGE</b>			See Leather Dyes section
<b>NOTES</b>	Solubility: 20 g/l	*With sulphuric acid; neutralised †With aluminium chloride ‡Acid or alkaline	

183	184	185	C.I. Acid Black
Monoazo (metallised) —	Monoazo (metallised) —	Monoazo (metallised) —	CHEMICAL CLASS  C.I. CONSTITUTION NUMBER
Black Redder	Bluish grey Duller	Black Redder	HUE Daylight Artificial light (tungsten)
4 (3 + levelling agent)  Moderate 1-2 Cotton—s, polyester—ss	4 (3 + levelling agent)  Moderate 2 Polyester—ss	4 (3 + levelling agent)  Moderate 3 Cotton—s, polyester—hs	DYEING: WOOL Method  Levelling S.D.C. migration test method/grade Staining other fibres
Nylon: levelling moderate Silk: from acetic acid bath	Nylon: levelling moderate Silk: from acetic acid bath	Nylon: levelling moderate Silk: from acetic acid bath	DYEING: OTHER FIBRES
Wool, silk, nylon Direct prints	Wool, silk, nylon Direct prints		PRINTING
ISO Wool      Nylon 4-5        4-5 3-4        — 4           — 4           — 4           5  —          — 7          6 —          —  4          4-5 3-4        4* 3           4 2          3-4*  4          4-5 3-4        4* 4           4 2           4 2          1-2*  4-5        5 4-5        4-5* 3-4        — 4          4-5 3-4        3-4*	ISO Wool      Nylon 4-5        4 3-4        — 3-4        — 4-5        — 4-5        4-5  6          5-6 6-7        6 —          6-7  4          4 4          4-5* 3          4-5 2-3        4*  4          4 3-4        4* 4          4 2          3-4 2          2*  4-5        5 4-5        4-5* 4          — 4          4-5 3-4        4-5	ISO Wool      Nylon 4-5        4-5 4           — 4           — 4-5        — 4-5        5  —          — 7          6-7 —          —  3-4        4-5 3-4        4* 3          4 2          3*  4          4-5 3-4        3-4* 3-4        4 2          4 1-2        1*  4-5        4-5 4-5        4* 4          — 4          4-5 3-4        3-4	FASTNESS PROPERTIES Method  Alkali Carbonising Chlorination — alteration staining wool Decatising  Light, $\frac{1}{2}$ - $\frac{1}{2}$ normal normal 2 × normal  Milling, alkaline — alteration staining wool Milling, acid — alteration staining wool  Peroxide bleaching — alteration staining wool Perspiration Potting — alteration staining wool  Sea water — alteration staining wool Stoving Washing — alteration staining wool
Moderate Little redder Little greener Little greener	Moderate Little change Redder Much greener	Poor Little change Little greener Little duller	OTHER PROPERTIES Dischargeability Effect of metals — copper chromium iron
			NON-TEXTILE USAGE
*Staining of nylon	*Staining of nylon	*Staining of nylon	NOTES

## NOTES



# AZOIC COLOURING MATTERS

The commercial products dealt with in the azoic sections are those used to produce insoluble azo dyes *in situ*, usually on a textile substrate. The basic principle of their application is the introduction of two small soluble components into the fibre and the use of suitable conditions for coupling to occur, resulting in the production of one larger, insoluble, coloured molecule. One component is selected from the available C.I. Azoic Coupling Components and the second from the C.I. Azoic Diazo Components. The latter are diazotised primary amines, or the parent amines when the dyer carries out the diazotisation. The former are often known as *naphthols* because the majority are derivatives of  $\beta$ -naphthol, and some commercial products have been sold under this name. For the purpose of the Colour Index, however, it was desirable to use descriptive terms which could not be associated with the nomenclature used by any individual dye manufacturer. The generic names first used in the Colour Index are now very widely adopted.

In addition to these two groups of products there is a third group, recorded as C.I. Azoic Compositions, which consists of mechanical mixtures of an azoic coupling component and an azoic diazo component. The latter is present in one of several stabilised forms, so that coupling does not occur until penetration into the fibre has occurred and the necessary activating conditions, generally steaming, are applied. Such products are normally used in textile printing and are applied by conventional printing techniques followed by treatment with acid and/or steam.

## Chemical Constitution

Information on the chemical constitution of the C.I. Azoic Coupling Components and the C.I. Azoic Diazo Components is contained in Vol. 4 under the section entitled 'Azoic'. This is in two parts:

C.I. 37500–37625 covering the C.I. Azoic Coupling Components

C.I. 37000–37270 covering the C.I. Azoic Diazo Components.

As the C.I. Azoic Compositions are mixtures no reference to their chemical composition appears in Vol. 4 but where these are known the identities of the two components are given in this section.

No distinction has been made between products containing the different stabilising agents and buffer salts which may be used within any one group classified under a particular number. It is recognised that such differences often affect the method of development and/or the properties of printing colours made up from individual members of the group but, as the constitution of the final colouring matter will be the same, it has been considered desirable to group them together.

## Application

In presenting data relative to the application and usage of azoic colorants it has been necessary, in most cases, to confine the details to application to cellulosic fibres and with particular emphasis to cotton.

The azoic dyes are unique in that the user selects the azoic coupling component and the azoic diazo component which when combined will give the desired result in terms of hue and fastness properties. In theory each C.I. Azoic Coupling Component can be combined with each C.I. Azoic Diazo Component, but in practice their use tends to be restricted to a limited number of combinations of proved value.

A selection has been made of these preferred combinations in accordance with information supplied by the makers and a directive is given in each of the sections, C.I. Azoic Coupling Components and C.I. Azoic Diazo Components. In order, however, to simplify presentation, details of the fastness properties of these recommended or preferred combinations are given only in the C.I. Azoic Diazo Component section.

Brief notes are included of some of the more important aspects of application in the case of the azoic coupling components, and of uses other than on cellulose, in the case of the diazo components, but it is necessary to emphasise that the complex and specialised nature of the processes for the application of azoic dyes can only be adequately covered by the comprehensive technical literature published by the manufacturers. As the normal methods of application to textile materials are substantially the same in principle for all members of the series, these are briefly set out below in order to avoid undue repetition in the text.

## Cellulose Materials

Dyeing is normally carried out in two stages, impregnation with an alkaline solution of the azoic coupling component being followed by immersion in a solution of the azoic diazo component. Application in the reverse order would normally be unsatisfactory because of the low affinity of the diazo salts.

### Impregnation with the azoic coupling component

Unless specially prepared by the manufacturer an azoic coupling component is insoluble in water and must be converted to the soluble salt, e.g. the sodium salt, by means of caustic soda. The ease with which solutions can be prepared varies considerably and a variety of dissolving methods are in use. For information on detailed recommendations the manufacturers' publications must be consulted, but the general methods recommended in the following tables are:

1. Paste with Turkey Red Oil and a little hot water, add water, raise to the boil, add the required amount of caustic soda and boil for a few minutes. If formaldehyde is to be added the solution should first be cooled.
2. Paste with alcohol or Cellosolve, add caustic soda, stir well and add water, and formaldehyde if required. Add the clear solution to the bath containing caustic soda and a protective colloid.
3. Paste with alcohol and add hot water containing 1 g/l caustic soda.

Loose fibre and yarn may be impregnated on the normal exhaustion dyeing machines. Fabric is dyed or padded, in which case drying may follow immediately.

The amount of azoic coupling component taken up by the material is determined by:

- (a) The concentration of the solution used.
- (b) The affinity of the azoic coupling component for the cellulosic material.
- (c) The temperature of impregnation or dyeing. The exhaustion of the bath decreases when the temperature is raised, unless very short dyeing times are used.
- (d) The concentration of added electrolyte, e.g. common salt.
- (e) The time of impregnation. Not less than 20–30 minutes should be allowed, except for padding and tub-liquoring.
- (f) The liquor to goods ratio employed.

In all cases where development is to take place without intermediate drying of the material excess azoic coupling



component solution should be removed. This is usually achieved by squeezing or hydro-extracting, but in the case of coupling components of higher affinity an alkaline brine rinse can be used. Failure to carry out this operation efficiently will lead to poor rubbing (crocking) fastness because of loosely held pigment formed during developing.

#### Development

Azoic diazo components are marketed in two main forms:

(1) as the free base, hydrochloride or sulphate of a primary amine which must be diazotised in the normal manner for such chemical compounds; (2) as stabilised diazo compounds generally referred to as *Salts*. This term must not be confused with the simple salts, hydrochloride or sulphate, of the free base. These *Salts* need only dissolving in cold water to be ready for use, saving the dyer the time and trouble of diazotisation.

As the textile material containing azoic coupling component normally also contains excess alkali, and diazo salts are unstable at high pH, it is usually necessary to arrange for neutralisation and buffering. The *Salts* contain the necessary agents to provide the correct conditions for many applications but it is desirable, especially when pad developing, to calculate the quantity of additional "alkali-binding agent" that may be required, using data supplied by the manufacturer. Excess acid should be avoided as it reduces the rate of coupling.

After development the material should be well rinsed and then treated at the boil in alkaline detergent solution to remove any loosely held dye and to develop the true hue and maximum fastness properties of the dyed material.

#### Other Materials

**SILK.** The dyeing method for silk is very similar to that used for cellulosic materials, but certain modifications are necessary because silk is a protein fibre. The main points to be observed relate to the alkalinity of the coupling component solution, the control of bath temperatures in order to avoid damage to the fibre, and the acidity of the developing baths, which are more acid in character than those employed in dyeing cellulosic fibres, addition of appropriate quantities of acetic acid or formic acid being made.

**FUR.** The method of application by impregnation with a solution of an azoic coupling component followed by development with an azoic diazo component is again similar to that followed in the previous applications, but the amount of alkali used to dissolve the coupling component must be kept to an absolute minimum consistent with getting the azoic coupling component into solution, and the use of certain solvents to replace much of the usual alkali is resorted to; both impregnation and developing are carried out at low temperatures, and careful selection of the combinations used is advisable if good results are to be achieved.

**CELLULOSE ACETATE, NYLON AND POLYESTER.** Azoic dyeings may be obtained on these fibres by applying selected azoic coupling components and azoic diazo components, sometimes from the same bath, in the same manner as disperse dyes are applied. Diazotisation is then carried out, at above room temperature, and coupling takes place. Suitable mixtures are marketed by some manufacturers and are listed among the C.I. Azoic Compositions.

#### Fastness Properties

The azoic dyes provide colourings of a high standard of fastness to light and wet processing and many combinations are extensively used for the production of bright intense hues, particularly in the yellow, orange and red ranges.

The fastness tables shown in the section dealing with the C.I. Azoic Diazo Components all refer to cotton, unless otherwise indicated, and are an average of the data received from all the various makers. They do, however, give a good indication of the fastness properties to be expected from the various combinations with selected azoic coupling components.

#### Textile Printing

Many C.I. Azoic Compositions have been formulated for development after printing and drying by simple neutral steaming. Many of these azoic compositions are also available in formulations intended for acid steaming or wet development. No distinctions have been made between these two types of products, except that when only products requiring acid steaming are available, this is indicated. Such information may, of course, become outdated.

It is also important to recognise the value of azoic colorants for the production of dyed grounds for discharge printing, for the direct printing of azoic diazo components on fabric previously impregnated with a suitable azoic coupling component, and for the production of special resist styles, which use the technique of printing selected azoic diazo components mixed with resist agents on a fabric previously impregnated with a suitable azoic coupling component and subsequently developing in a different azoic diazo component. Other specialised styles may be produced by printing a selection of different azoic coupling components and subsequently developing in a solution of a selected azoic diazo component. The details of such applications may be obtained by reference to the various publications of the manufacturers.

#### General Literature

The literature on the application of the azoic colorants is voluminous, and it is not possible, in the space available, to give detailed references to all the publications even of the last 25 years but, apart from the valuable original papers which have appeared in the *Journal of the Society of Dyers and Colourists* and in the *American Dyestuff Reporter*, any important paper wherever or whenever published has been abstracted in either one or both of these journals. The manuals on the dyeing of cotton and of silk and rayon and on printing of these fibres published by the former I.G. are a most useful source of information, as are the similar manuals produced by existing makers of azoic colorants. In the case of some speciality products the only literature available is that published by the makers.

The following textbooks also cover the general application of these products.

Horsfall, R. S., and Lawrie, L. G., *The Dyeing of Textile Fibres*, 2nd Ed. (London, Chapman and Hall, 1946).

Diserens, L., *Chemical Technology of Dyeing and Printing*, translated and revised by P. Wengraf and H. P. Baumann, Vol. 1 (New York, Reinhold, 1948).

Whittaker, C. M., and Wilcock, C. C., *Dyeing with Coal Tar Dyestuffs*, 5th Ed. (London, Balliere, Tindall and Cox, 1949).

Knecht, E., and Fothergill, J. B., *The Principles and Practice of Textile Printing*, revised by J. G. Hurst (London, Griffin, 1952).

Cockett, S. R., and Hilton, K. A., *Dyeing of Cellulosic Fibres* (London, Leonard Hill, 1961).

Trotman, E. R., *Dyeing and Chemical Technology of Textile Fibres*, 4th Ed. (London, Griffin, 1970).

C.I. Azoic Diazo Components

C.I. Azoic Diazo Component	C.I. Constitution Number or Class	HUES AND FASTNESS ON COTTON									Also suitable for
		C.I. Coupling Component	Hue	Light ( $\frac{1}{2}$ N) ISO	Light (2N)		Soda Boil	Peroxide	Hot Pressing	Chlorine	
1	37135	2	Dull Bluish Red	3	5	5	3	2	3	4-5	Silk, Acetate and Nylon
		3	Bordeaux	2	4	4-5	3	2	3-4	2	
		4	"	3	6-7	5-6	3-4	2	2	4	
		5	Yellowish Orange	1-2	3	2	3	4-5	3-4	3-4	
		6	Dull Reddish Violet	3	—	5-6	4	—	3	4	
		7	"	3-4	6	5-6	3	2-3	1	4-5	
		8	Bordeaux	3-4	6-7	5-6	3-4	1	2-3	4	
		10	Dull Bluish Red	3-4	4	5-6	2-3	2-3	2-3	5	
		11	Dull Red	3	6-7	6-7	2	3-4	2	5	
		12	Bordeaux	4-5	—	5-6	4	2-3	1	4-5	
		13	Bluish Grey, Black	—	6	—	—	2	4-5	4	
		15	Brown	2-3	—	5	1-2	—	2-3	3-4	
		16	Brownish Olive	—	2-3	—	—	1-2	3	3	
		17	Bordeaux	2	4-5	5	3	2	4	4-5	
		18	"	3	5	5	3-4	2-3	3-4	4	
		19	"	3-4	6-7	5-6	3-4	2-3	2-3	4	
		20	"	4	5	5-6	4	3-4	3	4	
		24	Dull Red	4-5	—	6	2-3	2-3	3	4	
		26	Bright Violet	4	—	6	4-5	4-5	3-4	—	
		29	Dull Bluish Red	—	6	—	—	2-3	—	3-4	
		34	"	4-5	—	5-6	—	3-4	—	5	
		36	Bordeaux	—	4	—	—	2	2-3	4	
		42	Bright Reddish Yellow	—	—	4-5	4	—	2-3	4-5	
2	37005	2	Bright Orange	4	4-5	5-6	3	1-2	1-2	3	Silk, Acetate and Nylon
		3	Reddish Brown	3	4	5	4	2-3	2	2	
		4	Bright Yellowish Red	2	4-5	4-5	2-3	1-2	3	3-4	
		5	Bright Yellow	2	4	4	5	3-4	3	3	
		6	Bright Red	3	—	6	3	—	4	5	
		7	Bright Yellowish Red	3	5	5	3	1-2	3-4	4-5	
		8	Bright Reddish Orange	5	6	6	4-5	3	3	4-5	
		10	Red	2-3	4	4	3	1	3-4	4	
		11	Yellowish Red	3-4	6	6	2-3	1	2	4	
		12	"	4-5	—	6-7	2-3	—	1	3-4	
		13	Dull Red Brown	5-6	7	6-7	4-5	2-3	4	4-5	
		15	Brownish Olive	5-6	—	6-7	4	3-4	2-3	4-5	
		16	"	—	7	—	—	2	3-4	3	
		17	Reddish Orange	1-2	4	3	2	1	1-2	3-4	
		18	Bright Orange	4-5	5	5	4	3	2-3	4-5	
		19	Reddish Orange	5	6-7	6	4	2	2-3	4-5	
		20	Bright Orange	4-5	6	6	4	2	2	5	
		23	Bright Yellowish Red	4-5	—	5-6	—	3	—	4	
		24	Reddish Orange	5	—	6	2	1	2	5	
		25	Dull Violet	4	—	6-7	4	—	4-5	4-5	
		26	Reddish Orange	5	—	6-7	3	3	5	4	
		29	Yellowish Red	—	5	—	—	1	—	3-4	
		34	Bright Yellowish Red	4	—	5	—	3	—	4-5	
		36	Reddish Brown	—	3	—	—	2-3	3-4	3-4	

# C.I. Azoic Diazo Components

C.I. Azoic Diazo Component	C.I. Constitution Number or Class	HUES AND FASTNESS ON COTTON									Also suitable for
		C.I. Coupling Component	Hue	Light ( $\frac{1}{3}$ N) ISO	Light (2N) AATCC ISO		Soda Boil	Peroxide	Hot Pressing	Chlorine	
3	37010	2	Bright Yellowish Red	4-5	6	5-6	3-4	1-2	4	5	Silk and Nylon
		3	Reddish Brown	3	5	5-6	4-5	3	2-3	3	
		4	Reddish Orange	3	6	6	3-4	2	2	4	
		5	Bright Yellow	3	5-6	5-6	5	4	4	4	
		6	Bright Reddish Orange	2-3	—	6	3	—	3	5	
		7	Bright Yellowish Red	4	6	5	3-4	3	3-4	3	
		8	Bright Reddish Orange	4-5	5-6	6	2-3	2-3	2-3	3-4	
		9	Bright Yellow	6	—	7	—	4-5	—	4	
		10	Bright Reddish Orange	3	5	6	4	1	4-5	4-5	
		11	Yellowish Red	5	6-7	6	3-4	1	3-4	4-5	
		12	Dull Reddish Brown	4-5	6-7	5	4-5	2	3	4-5	
		13	Bordeaux	5	7	5-6	3-4	4	4-5	3-4	
		15	Dull Yellowish Brown	3	—	6	2	—	2-3	5	
		17	Bright Bluish Red	2	4	3-4	2-3	1-2	3	4-5	
		18	Yellowish Red	4-5	6	5-6	3-4	2-3	3	4-5	
		19	Brown	5	7	6	4	3	2	4-5	
		20	Yellowish Red	4-5	6-7	6-7	4	3	4	5	
		24	Red	5	—	6	4	2	4	4-5	
		25	Dull Violet	4	—	7	4	—	3-4	4-5	
		26	Bright Yellowish Red	5	—	6	4-5	3	5	4-5	
		34	" " "	5-6	—	6	—	2	—	3-4	
		37	Brownish Olive "	6	—	7	4-5	3-4	4-5	4	
4	37210	2	Dull Bordeaux	2-3	4-5	4	3-4	3	3	4-5	Silk and Nylon
		4	" "	3-4	5	5	3-4	2	4	4-5	
		5	Yellowish Orange	3	4	5	4-5	3	3	4-5	
		6	Dull Bordeaux	3	—	6	3-4	—	3	4-5	
		7	" "	2-3	5	4-5	4	2	3	4-5	
		8	" "	3	5	5	4	3	3-4	4-5	
		10	" "	3	5-6	5	4-5	2	4	4-5	
		11	" "	4	5	5-6	3	2	3	4	
		12	" "	4-5	—	5-6	—	3	—	3-4	
		13	" "	4	—	6-7	4	—	3-4	4	
		15	Dull Reddish Brown	4	—	6	3-4	4	2	3	
		16	Dull Brown	4-5	—	6	4	3-4	4	4	
		17	Dull Bordeaux	2-3	4-5	4-5	3-4	2	2	4-5	
		18	Dull Reddish Violet	2-3	4-5	4	4	3	3	4-5	
		19	Dull Bordeaux	3	5	5	3-4	2	2	4-5	
		20	" "	3	4-5	5	1-2	2	3	5	
		23	" "	4	—	5	3-4	3	4-5	5	
		24	" "	4	—	5-6	3-4	3	2	4-5	
		26	Violet	4	5-6	5	4-5	4	4-5	4	
		34	Dull Bordeaux	4-5	—	5-6	—	3	—	4-5	



# C.I. Azoic Diazo Components

C.I. Azoic Diazo Component	C.I. Constitution Number or Class	HUES AND FASTNESS ON COTTON									Also suitable for
		C.I. Coupling Component	Hue	Light ( $\frac{1}{2}$ N) ISO	Light (2N)		Soda Boil	Peroxide	Hot Pressing	Chlorine	
5	37125	2	Bluish Red	4	4-5	5	2-3	1	4	4-5	Silk and Polyester
		3	Dull Bluish Red	2	5	5	2	2-3	3	1-2	
		4	Bluish Red	5	6	6-7	2-3	3	3	4	
		5	Bright Yellowish Orange	3	3-4	4-5	4-5	5	3-4	4-5	
		6	Bright Bluish Red	4	—	6	3-4	—	3-4	4	
		7	Bluish Red	3	4-5	5-6	3	1-2	3	3-4	
		8	" "	4	5	5-6	2	2-3	3-4	4-5	
		9	Reddish Yellow	4-5	—	5-6	—	3-4	—	4-5	
		11	Bluish Red	5	6-7	6-7	2-3	3	4	4-5	
		12	Dull Bluish Red	5	6-7	6-7	1-2	2	3	4	
		13	Dull Greenish Black	5	7-8	7	4-5	3-4	3-4	4	
		15	Dull Reddish Brown	5-6	—	7	3-4	4	3-4	4	
		17	Dull Bluish Red	2-3	3-4	4	2-3	1	4	4-5	
		18	Dull Red	4	5	5-6	2	1	2-3	4	
		19	Dull Bluish Red	5	6-7	6-7	2-3	1	2-3	3	
		20	Bluish Red	4	5-6	6	3-4	2	2-3	4	
		23	Dull Red	5	—	6	1	2	2	4	
		24	Dull Bluish Red	5	—	6-7	3	2-3	3	4	
		25	Black	5-6	—	7	4-5	3-4	4-5	4-5	
		26	Reddish Violet	4-5	—	6-7	3-4	4-5	3-4	—	
		32	Bordeaux	4-5	—	6	1-2	2	4-5	3-4	
		35	Bright Yellowish Orange	4	—	4-5	3-4	4	2	4	
		42	Reddish Yellow	—	—	4	3-4	—	2-3	4-5	
6	37025	2	Reddish Orange	4	5-6	6	2	1	2-3	4-5	Silk
		3	Dull Red	3	4-5	5	3	2	2-3	2-3	
		4	Bright Red	4-5	6	6	3	2	4	4-5	
		5	Bright Yellowish Orange	3-4	4-5	5	4	4	3-4	4	
		6	Bright Red	4	—	6-7	3-4	—	3-4	5	
		7	Red	5	5-6	6	2	1	1	4-5	
		8	" "	4-5	6	5-6	3	2	3	4-5	
		10	Bright Yellowish Red	3-4	5-6	5-6	2-3	1	3	4-5	
		11	Yellowish Red	6	7	6-7	3-4	1	4-5	4	
		12	Dull Yellowish Red	4	6-7	6	4	1-2	3	4-5	
		15	Dull Yellowish Brown	5	—	7	2	—	4	4	
		18	Bright Bluish Red	4-5	6	5	2	2	3	4-5	
		19	Dull Red	5	7	6	2	1-2	3-4	4	
		20	Red	4	6-7	5	2-3	2	3	3	
		23	Dull Red	5	—	5-6	—	2	—	4	
		32	Brown	6	—	7	2-3	1	1-2	2-3	
		33	Bright Reddish Yellow	4	—	4-5	3-4	—	3	3-4	
		34	Red	4-5	—	6	—	2	—	4-5	
7	37030	2	Yellowish Red	—	4	—	4	1	3-4	4-5	Silk and Nylon
		3	Brown	—	4-5	—	—	2-3	3	2	
		4	Red	—	5-6	—	—	1-2	4-5	4	
		5	Bright Yellow	—	4	—	—	3	3	3-4	
		7	Yellowish Red	—	4-5	—	—	1	4	4-5	
		8	Bright Red	—	4	—	—	1-2	3	4	
		10	" "	—	4	—	—	1	3-4	4	
		11	Yellowish Red	—	5	—	—	1	3	4	
		12	Dull Yellowish Red	—	5-6	—	—	1-2	3	4	
		13	Dull Reddish Brown	—	7	—	—	2	4-5	4	
		16	Yellowish Brown	—	6	—	—	1	2	3	
		17	Reddish Orange	—	3	—	—	1	2-3	4-5e	
		18	Yellowish Red	—	4-5	—	—	1	2	5	
		19	" "	—	6	—	—	1	2-3	3-4	
		20	" "	4-5	5	5	—	1	2-3	3	
		23	Brown	5	—	6-7	3	2	5	—	
		29	Red	—	4	—	—	1	2	4-5	
		36	Bordeaux	—	4	—	—	2-3	3	4	

# C.I. Azoic Diazo Components

C.I. Azoic Diazo Component	C.I. Constitution Number or Class	HUES AND FASTNESS ON COTTON									Also suitable for
		C.I. Coupling Component	Hue	Light (1/2N) ISO	Light (2N)		Soda Boil	Peroxide	Hot Pressing	Chlorine	
8	37110	2	Bright Red	4	6	6	3	1	4	4-5	Silk and Nylon
		3	Dull Red	3	4	5	3	2	3-4	1-2	
		4	Dull Bluish Red	4	6	6	3-4	2	3	4	
		5	Bright Reddish Yellow	2-3	4	4	3	5	4	3-4	
		6	Bluish Red	4	—	6	—	3	3-4	4	
		7	" "	4	5	5	3	2	2-3	5	
		8	" "	3-4	4-5	5	4	3	3-4	4	
		10	" "	3	4	5	2	1	2-3	4	
		11	Red	4-5	6	6-7	3	1-2	3-4	4	
		12	Bright Red	4-5	6	6	4	2	3-4	4-5	
		13	Bluish Grey, Black	4	6	7	2	2	4	4	
		15	Brown	4	—	6	2-3	2-3	2-3	4	
		16	Dull Brown	—	6	—	—	1	2-3	2	
		17	Red	2-3	4	3-4	2-3	1	3	4	
		18	Dull Bluish Red	4	6	6-7	3	2	3	4	
		19	Bright Red (Pink)	5	6	6-7	3-4	1-2	4	4-5	
		20	Dull Bluish Red	5	6	6-7	2	2	2-3	4-5	
		24	Bluish Red	4-5	—	6-7	3	2-3	3	4	
		25	Black	4	—	6	3	1-2	3	4	
		29	Bluish Red	—	5	—	—	2	—	4	
		32	Bordeaux	5	—	6-7	3-4	2	2	3-4	
		36	"	—	4	—	—	2	—	4	
9	37040	2	Red	4	5-6	6	3	1	4-5	4-5	Silk and Polyester
		3	Reddish Brown	3-4	5-6	5-6	3	1-2	4	2	
		4	Dull Bluish Red	4	6	5	2-3	2	3-4	4-5	
		5	Bright Reddish Yellow	2-3	3-4	4	4	4	3	3-4	
		6	Bright Red	4	—	7	3-4	—	3-4	4	
		7	Bluish Red	4	5-6	6	2	1-2	2-3	4	
		8	" "	4	5-6	6	3	2-3	3-4	4-5	
		10	Bright Red	3-4	5-6	6	2	1	3-4	4	
		11	Dull Bluish Red	4-5	6-7	6-7	3	1	2	2-3	
		12	Bright Red	5	6	6-7	3-4	2	4-5	5	
		13	Greenish Black	4	5-6	6-7	2-3	2-3	4-5	4	
		14	Bright Red	—	6	—	—	2	3	3	
		15	Brown	3	—	6	3-4	—	3-4	4	
		17	Yellowish Red	2	4	4	2-3	1	3-4	4-5	
		18	Dull Bluish Red	4	5	6	3	1-2	4	4-5	
		19	Bluish Red	5	6-7	6	4	1-2	2-3	3-4	
		20	Dull Bluish Red	4	6-7	6-7	3-4	2	3-4	4	
		23	Brown	5-6	—	6	—	2-3	—	3	
		24	Dull Reddish Brown	5-6	—	6-7	3	1	3	4	
		26	Dull Red	4-5	—	6	—	3	5	—	
		32	" "	5	—	6-7	3-4	—	4	2	
		34	Bright Red	5-6	—	6	—	—	—	4-5	
		40	Dull Red	5-6	—	4	—	2	—	3	
		41	Bright Red	—	—	6-7	3-4	2	4-5	3-4	

# C.I. Azoic Diazo Components

C.I. Azoic Diazo Component	C.I. Constitution Number or Class	HUES AND FASTNESS ON COTTON									Also suitable for
		C.I. Coupling Component	Hue	Light ( $\frac{1}{2}$ N) ISO	Light (2N) AATCC ISO		Soda Boil	Peroxide	Hot Pressing	Chlorine	
10	37120	2	Dull Red	2	4	4	3-4	1	4	4-5	Silk and Nylon
		3	Reddish Brown	3	4	5	4	3	4	3	
		4	Bluish Red	3	4	5	4	1	2	4	
		5	Bright Yellow	2-3	5	4-5	4-5	4-5	4	4-5	
		6	Bluish Red	2	—	4-5	3-4	—	3-4	5	
		7	Dull Bluish Red	2	4	4-5	4	3	2	4-5	
		8	Dull Red	1-2	4	3-4	4-5	3	3-4	4-5	
		10	Bluish Red	1-2	2	3-4	3-4	1	2-3	4	
		11	Dull Red	3-4	5	6	4	3	1-2	4-5	
		12	Dull Bluish Red	5	4	6	4-5	3	3-4	4	
		13	Reddish Black	5	6	7	3-4	4	3	4-5	
		15	Dull Brown	5	—	7	4	3	2-3	5	
		16	Brownish Olive	5	6	6	4	3-4	4	3-4	
		17	Bright Bluish Red	3	4	4	3	1-2	3	4-5	
		18	Red	1-2	4	4	3-4	3	4	4-5	
		19	Bluish Red	3	4	5	4	3	4	4	
		20	Bright Red	3	5	5	4-5	3-4	4	4-5	
		23	Dull Red	4-5	—	6	2	2-3	4	4	
		24	" "	4-5	—	6-7	4-5	3	3	5	
		25	Dull Violet	4	—	6-7	4	—	3-4	4-5	
		26	Bluish Red	4	—	5	4	3	5	4-5	
		28	" "	4	—	5	4	2-3	4	4-5	
		29	Red	—	4	—	—	3	3-4	4	
		36	Dull Bluish Red	—	3	—	—	2	2-3	4	
		37	Reddish Brown	6	—	6-7	4	3	4	4-5	
11	37085	2	Bright Red	1-2	4	4-5	3	2	4	4	Silk, Acetate and Nylon
		3	Reddish Brown	2	4	5	3-4	3	2	2	
		4	Bluish Red	3	4	5	3-4	1	2	2	
		5	Bright Yellow	1	4	3-4	5	4-5	3-4	4	
		6	Bright Yellowish Red	2	—	5	4	—	1-2	1-2	
		7	Bright Red	2	4	4	3-4	3	3-4	3-4	
		8	Yellowish Red	4	5	5	5	3-4	4	4-5	
		9	Bright Yellow	3-4	—	5	—	4-5	—	4	
		10	Bright Red	2-3	3	4	3	1	3-4	3-4	
		11	Bluish Red	4-5	5	5-6	4	2	4	4	
		12	Red	5	6	6	4	3	4	4	
		13	Dull Violet	—	6	—	—	3	4-5	4	
		15	Brown	4	—	6	3-4	3	3-4	4	
		16	Dull Yellowish Brown	5	—	6-7	4	4	3	4-5	
		17	Red	2	3	3	3-4	1	3	3	
		18	Yellowish Red	3	5	5-6	4	2	3	3	
		19	Dull Red	3	4	5-6	2-3	1	2-3	2-3	
		20	Bright Red	4	5	5-6	3-4	2	3	3	
		23	" "	5	—	6	4-5	2-3	5	5	
		24	Red	5	—	6-7	4-5	3	4-5	4	
		25	Dull Blue	3-4	—	6-7	4-5	—	3	3	
		26	Bright Red	4-5	—	5	4	3	5	4-5	
		28	" "	4-5	—	5-6	4-5	2-3	4	4-5	
		29	" "	—	5	—	—	3	—	4	
		32	" "	4	—	6	4-5	2	3-4	5	
		36	Bordeaux	—	3	—	—	2	2	3	
		37	Reddish Brown	5-6	—	6	4-5	4	3-4	4-5	
		44	Yellow	—	—	7	4-5	—	3-4	4	

# C.I. Azoic Diazo Components

C.I. Azoic Diazo Component	C.I. Constitution Number or Class	HUES AND FASTNESS ON COTTON									Also suitable for
		C.I. Coupling Component	Hue	Light (1N) ISO	Light (2N)		Soda Boil	Peroxide	Hot Pressing	Chlorine	
12	37105	2	Bright Yellowish Red	3-4	7	5	3-4	2	4	4-5	Silk and Nylon
		3	Reddish Brown	3	5	6	4	2-3	3	1-2	
		4	Bright Red	4	5	5-6	3-4	2-3	4	5	
		5	Bright Yellow	2	2-3	3	3-4	4	3	3-4	
		6	Bright Yellowish Red	3	—	5-6	3	—	4	5	
		7	" "	3-4	4-5	5-6	3-4	3-4	3-4	4-5	
		8	Bright Red	3	4-5	4-5	3-4	3	2-3	4-5	
		10	" "	2-3	3	4	2	1	3-4	4-5	
		11	Bright Reddish Orange	4	4-5	5-6	2-3	3	4	4	
		12	Bright Red (Pink)	5	6	5-6	—	2-3	3	5	
		13	Dull Violet	4	7	7	3-4	3-4	4	4-5	
		15	Dull Yellowish Brown	3-4	—	6	3-4	—	4	5	
		17	Bright Bluish Red (Pink)	3	3-4	4	2-3	2	3-4	4-5	
		18	Bright Yellowish Red	4	4	5	3-4	2-3	4	4-5	
		19	" "	4-5	4-5	5-6	4	2-3	3-4	4	
		20	Bright Red	4	4-5	5	3-4	3	4-5	5	
		23	Bright Yellowish Red	4-5	—	5-6	4	3	4	4	
		24	Bright Red	4	—	5-6	3	2	3-4	4-5	
		25	Dull Violet	3-4	—	6-7	4	—	4-5	4-5	
		26	Yellowish Red	4-5	—	5	3-4	2	5	5	
		28	" "	4	—	5	4-5	2-3	4	4-5	
		37	Dull Brown	6	—	6-7	3-4	3-4	4	3-4	
13	37130	2	Bright Red	2	4-5	5	3	2	4	4-5	Silk, Acetate and Nylon
		3	Reddish Brown	2-3	5	5	3-4	2-3	3	2-3	
		4	Bluish Red	3	5	5-6	4	1	3-4	4	
		5	Yellow	2	3	3-4	3-4	4-5	3-4	3-4	
		6	Bright Red	3	—	6	3-4	2-3	3	5	
		7	" "	3	5	5	3	2-3	4	5	
		8	" "	3	4-5	5-6	3-4	2	3-4	5	
		10	" "	2	3-4	4	2	1	4	4	
		11	Bright Yellowish Red	3	5	5	3	1-2	3-4	5	
		12	Red	4	6	5-6	3	2-3	4	4-5	
		13	Dull Violet	4	7	6-7	3	2	4	4-5	
		15	Yellowish Brown	4	—	6-7	2	—	2	5	
		17	Bright Bluish Red	2-3	3-4	4-5	2-3	1	3-4	4-5	
		18	Bright Red	2-3	4	4-5	3	2-3	4	5	
		19	" "	3	5	5-6	3-4	2-3	3	4	
		20	" "	4	4-5	5	3	2-3	4	5	
		23	Bright Yellowish Red	4	—	5-6	3	2-3	5	4-5	
		24	Bright Bluish Red	4-5	—	6-7	3-4	2	4	5	
		25	Dull Violet	4	—	6-7	4	—	4	4-5	
		26	Bright Red	4-5	—	5	3-4	3	3-4	5	
		41	Bright Yellowish Red	—	—	5	3-4	2	4-5	4	
14	37151	2	Bright Red	—	4	—	—	1	3-4	4-5	Silk, Acetate and Nylon
		3	Reddish Brown	—	5	—	—	3	4-5	5	
		4	Bluish Red	—	5	—	—	2	4	4-5	
		5	Bright Yellow	—	6	—	—	5	4	4-5	
		7	Bright Red	4	5	6	4-5	4	4	4-5	
		8	Bluish Red	—	5	—	—	4	2-3	5	
		10	Bright Red	—	4	—	—	1	3	5	
		11	Yellowish Red	—	5	—	—	2	2-3	5	
		12	Red	—	6-7	—	—	3	4	3-4	
		13	Dull Bordeaux	—	7	—	—	3	2-3	4-5	
		16	Brown	—	6	—	—	3	1-2	4	
		17	Red	—	4	—	—	1	1-2	4	
		18	Bluish Red	—	7	—	—	3-4	4	4	
		19	" "	—	6	—	—	1-2	4	5	
		20	Red	—	6	—	—	2-3	3-4	5	
		29	Bluish Red	—	6	—	—	2-3	—	4-5	
		36	Dull Brown	—	3	—	—	2	5	3	



C.I. Azoic Diazo Components

C.I. Azoic Diazo Component	C.I. Constitution Number or Class	HUES AND FASTNESS ON COTTON									Also suitable for
		C.I. Coupling Component	Hue	Light (1/2N) ISO	Light (2N)		Soda Boil	Peroxide	Hot Pressing	Chlorine	
15	37180	7	Bright Red	4	—	5	5	3-4	5	5	Silk
16	37045	2	Bright Orange	5	—	6	3-4	1	4-5	4-5	
		4	" "	5	—	6	3	3	3	4-5	
		7	Bright Reddish Orange	4-5	—	5-6	3	1	4-5	4-5	
		8	" " "	4	—	5	3	1	3	4	
		10	" " "	4-5	—	5-6	3	2	4	4	
		16	Dull Yellowish Brown	6-7	—	7-8	3-4	3	4	4	
		18	Bright Orange	5	—	6	3	1	3	4	
		20	" "	5	—	6-7	3	1	4-5	4-5	
		23	Reddish Orange	5	—	6	4	1	5	2-3	
		32	Dull Reddish Orange	4-5	—	6-7	3-4	2	4	2-3	
		44	Bright Orange	—	—	7	4-5	—	3-4	4	
17	37055	2	Bright Yellowish Red	5	—	6-7	4	1	4-5	4	
		10	" " "	5	—	6	4	1	3	4	
		16	Brown	6-7	—	7	2	3	3-4	3-4	
		23	Reddish Orange	5	—	6	3-4	2	3-4	4	
		28	Bright Yellowish Red	5	—	6-7	4	2-3	4	4-5	
		32	Dull Reddish Orange	4-5	—	6-7	4-5	1	3	3	
18	37060	8	Bright Orange	5	—	6-7	4	2	3-4	4-5	
		11	Reddish Orange	5	—	5-6	—	1-2	—	4-5	
		12	Brown	5	—	6	2-3	1-2	4-5	4	
		20	Bright Reddish Orange	5	—	6-7	3-4	1	3-4	4-5	
		24	" " "	5	—	6-7	4	2	3-4	4-5	
19	37065	2	Bright Yellowish Orange	5	—	6	3-4	1	4-5	4	
		7	Bright Orange	5	—	6	3	1	3	4-5	
		8	Bright Yellowish Orange	4-5	—	5-6	3-4	2	3-4	3-4	
		10	Bright Yellowish Orange	4-5	—	5-6	3	2	3	4	
		11	Bright Orange	4-5	—	5-6	2	1	2-3	4	
		12	Dull Reddish Orange	5	—	6	3-4	2-3	3	3-4	
		18	Bright Yellowish Orange	5	—	6	4	1-2	3-4	3-4	
		23	Dull Reddish Orange	6	—	6-7	4	2	5	4	
		32	" "	5-6	—	7	3-4	1	4	2	
		41	Bright Orange "	—	—	6-7	3	2	4	4-5	
20	37175	2	Reddish Navy	4	5-6	5	4-5	3	3	4	Silk
		4	" "	4	5	5	—	4	2-3	3-4	
		7	" "	4	5	4-5	3-4	3-4	2	4	
		8	" "	4	5-6	5	4	3-4	2-3	4	
		10	Navy	4	5	5	4-5	4	2-3	4	
		11	Bluish Violet	4	5-6	5	4	3	2-3	3-4	
		12	Dull Reddish Blue	4	5	5	3-4	3	3	3	
		13	Dull Greenish Blue	5	6-7	6-7	4	3	4-5	3	
		17	Violet	4	5	4-5	—	3-4	3	3-4	
		18	Dull Reddish Navy	4	5-6	5	4-5	3-4	3-4	4	
		19	Dull Reddish Violet	4	5-6	5	—	3	3	3-4	
		20	Dull Bluish Violet	4	—	5	4-5	3	3	4	
		24	Dull Reddish Blue	4	—	5	4	2-3	3	3-4	
		25	Dull Greenish Navy	5	—	6-7	4	2-3	4	3	
		36	Dull Green	4	4-5	5	4-5	4-5	3	3	
21	37200	7	Dull Reddish Brown	4	—	5	4-5	4	4	4	
		11	" " "	4	—	5-6	3	4	4	4	
		17	Reddish Brown "	3	—	4-5	4-5	3	3	4	
		30	Dull Reddish Brown	4	—	6	4-5	4	3-4	4	

# C.I. Azoic Diazo Components

C.I. Azoic Diazo Component	C.I. Constitution Number or Class	HUES AND FASTNESS ON COTTON									Also suitable for
		C.I. Coupling Component	Hue	Light (1N) ISO	Light (2N)		Soda Boil	Peroxide	Hot Pressing	Chlorine	
22	37240	2	Navy	4-5	6	5-6	—	3	3-4	3-4	Silk
		3	Reddish Black	—	2	—	—	3	2	2-3	
		4	Navy	—	5-6	—	—	4-5	2-3	3	
		5	Yellowish Orange	—	1-2	—	—	3	4	2	
		7	Reddish Navy	—	4	—	—	4	2	3-4	
		8	" "	—	4-5	—	—	4	2-3	3-4	
		10	Navy	—	5	—	—	4	2-3	3-4	
		11	Greenish Navy	—	6	—	—	3	3	2-3	
		12	Reddish Navy	—	5	—	—	2	3	1-2	
		13	Navy	—	5	—	—	3	3-4	2-3	
		16	Reddish Brown	—	2	—	—	3	2	2	
		17	Navy	—	5-6	—	—	3-4	3-4	2	
		18	Reddish Navy	—	6	—	—	3	3	3-4	
		19	Navy	—	5-6	—	—	4-5	3-4	2-3	
		20	Reddish Navy	—	5-6	—	—	4	2-3	2-3	
		36	Bluish Green	—	3-4	—	—	2-3	4-5	2-3	
23	37205	7	Bluish Black	—	6	6	—	3-4*	4*	5	*AATCC
		17	" "	—	6	6	—	2*	3-4*	5	
		19	Reddish Black	—	6-7	6-7	—	3-4*	3-4*	5	
		24	" "	—	5-6	—	—	1-2*	4*	5	
24	37155	2	Reddish Navy	4	5-6	5	4	3	3	4	Silk, Acetate and Nylon
		3	Violet	—	2-3	—	—	3-4	5	2-3	
		4	Reddish Navy	4	5	4-5	—	3	2-3	4	
		5	Yellowish Orange	—	2	—	—	5	4	2-3	
		7	Reddish Navy	3-4	5	4-5	—	3-4	2	4	
		8	" "	4	5-6	5	4	4	2-3	4	
		10	" "	4	5	4-5	4-5	4	2-3	4	
		11	" "	4-5	5-6	5	4	3-4	2-3	3-4	
		12	Bluish Violet	4-5	5	5	—	4	3	2-3	
		13	Reddish Navy	—	6-7	—	—	2	4-5	3	
		16	Reddish Brown	—	7	—	—	3	2-3	2	
		17	Reddish Navy	4	5-6	5	—	2-3	3	4	
		18	" "	4	5-6	5	3-4	3-4	3-4	4	
		19	Bluish Violet	4	5-6	5	4-5	2	3	3	
		20	Reddish Navy	4	5	5	4-5	3	3	3-4	
		24	Bluish Violet	4	—	5	—	3	—	3-4	
		36	Greenish Blue	—	4	—	—	2	3	3	
25		This number discontinued; transferred to C.I. Azoic Diazo Component 14									
26	37070	2	Bright Red	4	—	4-5	4-5	3	5	5	
		3	Dull Red	3	—	4	3-4	3	5	4	
		4	Bright Red	4	—	5	3-4	3	4-5	4	
		5	Bright Reddish Yellow	4	—	5	5	5	5	5	
		7	Bright Yellowish Red	3	—	5	4	3	3	5	
		12	Dull Bluish Red	4-5	—	5-6	3	3	1	3	
		15	Brown	5	—	6-7	4	4	4	4	
		19	Bright Red	4-5	—	5-6	4	3	5	4	
		20	" "	4	—	5	3-4	3	4	5	
		23	Red	4-5	—	5-6	3-4	2	4-5	4	
		33	Bright Greenish Yellow	4-5	—	6	5	5	5	5	
		35	Bright Yellow	4	—	5	5	5	4-5	4	
27	37215	2	Dull Bordeaux	4	4	4-5	3-4	3	4	4-5	Silk
		4	" "	4	4-5	4-5	3-4	3	2	4	
		7	" "	3	4	4-5	3	3	3-4	4-5	
		12	" "	4	5	5	3-4	3	3-4	3	
		19	Dull Red	3-4	5	5	—	3	1	4-5	
		24	Dull Bordeaux	4	—	5	3-4	3	3-4	3	
28		This number discontinued; transferred to C.I. Azoic Diazo Component 14									

# C.I. Azoic Diazo Components

C.I. Azoic Diazo Component	C.I. Constitution Number or Class	HUES AND FASTNESS ON COTTON									Also suitable for
		C.I. Coupling Component	Hue	Light ( $\frac{1}{3}$ N)	Light (2N)		Soda Boil	Peroxide	Hot Pressing	Chlorine	
29	37140	12	Red	5-6	—	7	4-5	3	4	5	
30		4	Bluish Red	—	—	5-6	4-5	4	4	3-4	
		7	Dull Bluish Red	—	—	5	4-5	3-4	4	4	
		12	"Bluish" Red "	—	—	5-6	4-5	4	3-4	3-4	
		20	"Bluish" Red "	—	—	5-6	4-5	3-4	4	3-4	
		23	Dull Bluish Red	—	—	5-6	4-5	3	3-4	3	
		32	"Greenish" Yellow	—	—	5	5	4	3-4	3-4	
		42	"Greenish" Yellow	—	—	3-4	4-5	—	2-3	3-4	
31	37145	45	Dull Bluish Red	—	—	5-6	4-5	4	4	3-4	
		2	Bright Red	4	—	4-5	—	1	—	5	
		9	Greenish Yellow	4	—	5	—	4	—	4	
		11	Bright Orange	4	—	4-5	—	1	—	4-5	
		12	Red	5	—	5-6	—	1	—	5	
		16	Dull Brown	6	—	7	3-4	2	3	2-3	
		19	Bright Yellowish Red	4	—	5-6	—	1	—	4	
		20	Bright Orange	4	—	5	—	—	—	5	
		23	Bright Red	4-5	—	6	—	3	—	4	
		24	Bright Yellowish Red	5-6	—	6-7	4-5	3	4-5	3	
32	37090	2	Bright Red	2	4-5	4	2-3	1	4	4-5	Silk and Nylon
		3	Reddish Brown	2	5	5-6	4	2-3	3-4	3	
		4	Red	4	6	5-6	3-4	2	3-4	4-5	
		5	Bright Yellow	3	5	4-5	5	5	3-4	4-5	
		6	Bright Red	3-4	—	5-6	5	—	3-4	5	
		7	"Bright" Yellowish Red	3-4	5-6	5-6	4-5	3-4	3-4	5	
		8	Bright Yellowish Red	4	5-6	5-6	4-5	3-4	4	5	
		9	Bright Yellow	5-6	—	6-7	4-5	4-5	3-4	4	
		10	Bright Red	2	5	3-4	4	1	2	4-5	
		11	Bright Reddish Orange	4	6	5	3	2	4	4-5	
		12	Dull Red	—	7	—	4-5	2-3	2-3	5	
		13	Bordeaux	4	6-7	6-7	4	3-4	4-5	4-5	
		14	Bright Yellowish Red	4-5	6	5-6	—	3	4	4-5	
		15	Brown	4	—	6	1-2	—	2-3	5	
		16	Dull Brown	4	6	6	4	3-4	3-4	4	
		17	Red	2	4	3	2	1-2	3	4	
		18	Bright Red	3	6	5	3-4	2-3	3-4	5	
		19	Red	4-5	6-7	6	4	2-3	4	4-5	
		20	Bright Yellowish Red	3	6	5-6	4	2-3	4	5	
		23	Red	5	—	6	3	2	5	5	
		24	Dull Yellowish Red	3	—	5-6	3-4	2	3	4-5	
		25	Black	4	—	7	4	—	3	4-5	
		26	Bright Yellowish Red	4-5	—	5-6	5	2	5	4-5	
		28	Bright Red	4	—	5	5	2	4	4-5	
		33	Bright Greenish Yellow	4-5	—	5-6	4-5	4	3-4	3	
		41	Bright Yellowish Red	—	—	5-6	4-5	2	4	4-5	
33	37075	2	Bright Red	—	4	—	—	3	5	4	Silk, Acetate and Nylon
		3	Dull Reddish Brown	4	5-6	5	3-4	3	4	4	
		4	Bluish Red	4	5	5	4	3	1	4	
		5	Yellow	—	4-5	—	—	4	5	4	
		7	Bright Yellowish Red	4	5	5	4	2	4	4-5	
		8	Dull Yellowish Red	—	4	—	—	3	4	4	
		9	Yellow	4	—	5	—	2	—	2	
		10	Red	—	3-4	—	—	3	2	5	
		11	Dull Red	4-5	6-7	5	4	3	2	4	
		12	Red	5	6-7	6	4-5	2	5	5	
		13	Dull Bordeaux	—	7	—	—	3-4	4	3-4	
		16	Brownish Olive	—	6	—	—	2-3	2	3-4	
		17	Dull Red	—	2-3	—	—	2	2	3	
		18	Red	—	4	—	—	3	4	4	
		19	Dull Yellowish Red	4-5	6-7	5-6	4-5	2	3	4	
		20	Bright Yellowish Red	4	5	4-5	4-5	2	5	4-5	
		23	" " "	5	—	6	4	2	5	4	
		24	Red " "	5	—	6	4	3	5	4	
		25	Reddish Black	—	—	—	—	—	—	—	
		32	Bright Red	4-5	—	6-7	4-5	2	4	5	
		33	Bright Yellow	4-5	—	6	5	4	5	3-4	
		35	" " "	4	—	5	5	4	5	3-4	
		36	Bordeaux " "	—	2-3	—	—	2	5	4	
		40	Dull Red	4	—	5	—	3	—	4	
		41	Bright Red	—	—	5	4-5	3	4-5	4-5	

# C.I. Azoic Diazo Components

C.I. Azoic Diazo Component	C.I. Constitution Number or Class	HUES AND FASTNESS ON COTTON									Also suitable for
		C.I. Coupling Component	Hue	Light ( $\frac{1}{3}$ N) ISO	Light (2N)		Soda Boil	Peroxide	Hot Pressing	Chlorine	
34	37100	2	Bluish Red	3-4	4	5-6	2-3	1	3-4	3-4	Silk
		3	Reddish Brown	3	5-6	5-6	3	2	3-4	1-2	
		4	Dull Bluish Red	4-5	6	7	3	1-2	2	3-4	
		5	Bright Yellowish Orange	2-3	4-5	4-5	4-5	5	3-4	3-4	
		6	Bluish Red	3	—	6	3	—	3-4	4-5	
		7	Bright Red	3	4	5	3	2	2-3	4	
		8	Bluish Red (Pink)	4-5	5	6	2-3	3-4	3-4	4-5	
		10	Red	3-4	3-4	5-6	2-3	1	3	3-4	
		11	Bright Bluish Red (Pink)	5	6	7	3	2-3	4-5	4-5	
		12	Dull Reddish Violet	5	—	6-7	2	2-3	3-4	4	
		13	Reddish Black	6	—	6-7	3-4	2-3	4	3-4	
		14	Bright Yellowish Red	—	—	—	—	—	4	5	
		15	Reddish Brown	5	—	7	3-4	3-4	3-4	4-5	
		16	Brown	5	—	6-7	1-2	1	1	2	
		17	Red	2-3	2-3	5	2	1	3	3-4	
		18	Bluish Red (Pink)	3-4	4	5	2-3	2	3	4-5	
		19	Bordeaux	4	6-7	6-7	2-3	1	1-2	2	
		20	Bluish Red (Pink)	5	5-6	6-7	2-3	1-2	2-3	3	
		23	Dull Red	5	—	6-7	1	2	3	3	
		24	Bluish Red	5	—	6-7	2-3	2-3	3-4	4-5	
		25	Dull Bluish Black	4-5	—	7	4-5	—	4-5	3-4	
		26	Dull Bluish Red	5	—	6	2	3	5	4-5	
		32	Bluish Red	5	—	6-7	1-2	3-4	3-4	4	
		42	Yellow	—	—	4	3-4	—	2-3	4-5	
35	37255	2	Reddish Navy	3-4	6-7	6	4-5	3	3	3	Silk
		3	Reddish Black	1	2-3	3-4	4	4	4-5	2	
		4	Navy	2-3	5-6	5	4-5	3-4	2	2	
		5	Dull Brown	1	2	1	4	4	3-4	2	
		7	Reddish Navy	3	5-6	5-6	5	3-4	3	3	
		8	" "	3	5	6	5	3-4	3-4	3	
		10	" "	3-4	5-6	5-6	5	4	4-5	3-4	
		11	Navy	3	6	6	5	3	3-4	2	
		12	Reddish Navy	4	6	6	3	1-2	3	4	
		13	" "	3-4	5-6	5-6	5	2-3	3	3	
		16	Reddish Brown	—	1-2	—	—	2	2	1-2	
		17	Navy	3	6	5	5	1-2	3-4	3	
		18	Dull Bluish Violet	4	6-7	6	5	3-4	3	3	
		19	Reddish Navy	2	5	4	4	3	3-4	2	
		20	Navy	4	6	6	4	2-3	3	2-3	
		24	"	3	—	5-6	5	—	3	4	
		25	Black	3	—	6	4	—	3-4	3	
		29	Reddish Navy	—	5	—	—	3-4	3-4	3	
		36	Bluish Green	—	4	—	—	2-3	4-5	2-3	



# C.I. Azoic Diazo Components

C.I. Azoic Diazo Component	C.I. Constitution Number or Class	HUES AND FASTNESS ON COTTON									Also suitable for
		C.I. Coupling Component	Hue	Light ( $\frac{1}{2}$ N) ISO	Light (2N)		Soda Boil	Peroxide	Hot Pressing	Chlorine	
36	37275	2	Bright Red (Pink)	3	5-6	5	3	3	3	4-5	
		3	Dull Reddish Brown	4	6-7	6	2-3	2	3-4	3	
		4	Yellowish Red	5	7	6-7	2-3	3	3-4	4-5	
		5	Yellowish Orange	4	5	5-6	3-4	5	4	4-5	
		6	Bright Reddish Orange	4	—	6-7	2	—	2-3	4-5	
		7	Dull Red	4	6	5-6	3-4	5	4	4-5	
		8	Red	5	6-7	6-7	2-3	3	2	5	
		10	Bright Yellowish Red	4	6	5-6	2-3	2	3	4	
		11	Dull Red	5	6-7	6-7	3	2	3	4-5	
		12	Dull Yellowish Red	5	7	6-7	2	2	1-2	4	
		13	Reddish Black	4	6-7	7	2	3	4	4	
		14	Bright Yellowish Red	—	—	—	—	—	3-4	4	
		16	Dull Reddish Brown	5-6	6-7	6-7	2	2-3	3-4	3	
		17	Bluish Red	3	6	6	2-3	2-3	2-3	4	
		18	Dull Yellowish Red	5	6-7	6-7	2-3	2	2	5	
		19	" " "	5	7	6-7	2-3	2	2	4	
		20	" " "	5	6-7	6-7	3	2-3	2-3	5	
		23	Reddish Brown "	6	—	7	2-3	3	3	3-4	
		24	Bluish Red	5	—	6	2-3	2	2	4-5	
		25	Black	4-5	—	6-7	2-3	—	4-5	3-4	
		26	Bright Bluish Red	5-6	—	6	3-4	2	3-4	3	
		33	Bright Yellowish Orange	5-6	—	6-7	3-4	4-5	3	4	
		34	Dull Red	6	—	7	—	4	—	5	
		35	Bright Orange	5-6	—	6-7	4	—	2-3	4-5	
		44	Orange	—	—	7	4-5	—	3-4	4-5	
37	37035	2	Yellowish Red	4	5	5	1-2	1	4	3	Polyester
		3	Reddish Brown	3	5	6	2-3	2	3	1-2	
		4	Dull Yellowish Red	2	5	5	1-2	1	2-3	4	
		5	Bright Yellow	2	3	4	3	3-4	4	3-4	
		6	Yellowish Red	3	—	5-6	2-3	—	2	3-4	
		7	Red	3	4-5	5	2	1	3	3-4	
		8	Bright Red	5	5	5	2-3	1-2	3-4	4	
		10	Yellowish Red	3	4-5	5-6	1-2	1	3-4	3-4	
		11	Dull Yellowish Red	4	5-6	6	1	1	3	2	
		12	Reddish Brown	6	6-7	6-7	2-3	2	3	4	
		13	Black	6	6-7	6-7	3-4	2	5	3-4	
		15	Brown	6	—	7	3	2-3	4	3-4	
		17	Yellowish Red	1-2	3	3	2	1	2-3	3	
		18	" " "	3	5	5	1-2	1	3-4	2	
		19	Dull Yellowish Red	3	5-6	6	2	1	2	1-2	
		20	Reddish Orange	4-5	5-6	5	2	1-2	3-4	4	
		23	Dull Red	5	—	5-6	—	2	—	4	
		24	Red	5	—	7	2	—	3-4	3-4	
		25	Black	4	—	7	3	—	5	3-4	
		32	Bluish Red	5-6	—	7	2	2-3	3-4	2-3	
		34	Red	5	—	5-6	—	2-3	—	3-4	
38	37190	2	Bluish Black	2-3	5	5	3-4	3	3-4	4-5	Silk
		3	Reddish Black	3	3	4-5	—	3	5	3-4	
		4	Bluish Black	2	5	5	—	4	2-3	5	
		5	Bordeaux	1-2	2	2-3	3-4	5	3	3-4	
		7	Bluish Black	2-3	5-6	5	3-4	4	3	4-5	
		8	" "	3	5	5-6	—	3	3	5	
		10	" "	3-4	4	5-6	—	3	4	5	
		11	" "	3	5-6	6	—	3	3-4	5	
		12	" "	3	5-6	6	—	2-3	2-3	5	
		13	" "	—	4-5	—	—	3	5	3-4	
		16	Greenish Black	—	5	—	—	1	4	2	
		17	Bluish Black	2-3	5-6	5	—	3	3-4	4-5	
		18	" "	2-3	5	5	—	3	3	4-5	
		19	" "	3-4	6	5-6	4	3-4	3	4-5	
		20	" "	3-4	5	5	—	3	3	4	
		24	" "	4	—	5-6	4	3	—	5	
		25	Black	4	—	6-7	—	—	—	3-4	
		36	Bluish Green	—	4-5	—	—	2	3-4	3	
		42	Bluish Red	—	—	5	4-5	—	4	4	
		44	Bordeaux	—	—	5-6	4-5	—	4	4	

# C.I. Azoic Diazo Components

C.I. Azoic Diazo Component	C.I. Constitution Number or Class	HUES AND FASTNESS ON COTTON									Also suitable for
		C.I. Coupling Component	Hue	Light ( $\frac{1}{2}$ N) ISO	Light (2N) AATCC ISO		Soda Boil	Peroxide	Hot Pressing	Chlorine	
39	37220	2	Dull Bluish Red	3-4	5	5	3	3	4	4	Silk
		3	" " "	2-3	2	5	3	2	4-5	3	
		4	Dull Reddish Violet	3	5	5	2-3	2	2-3	4	
		5	Reddish Orange	2	2	3	3-4	4	3-4	3-4	
		7	Dull Bluish Red	3	5	5	4	3	4	4	
		8	Dull Bordeaux	3	—	5	3	3	2-3	4	
		10	Dull Reddish Violet	3-4	5	5	3	3	4-5	4	
		11	" " "	3-4	5	5-6	3-4	3	3-4	4	
		12	Dull Bluish Red	3-4	5	5-6	3	3	4	5	
		13	Greenish Black	3-4	5	5-6	5	4	3-4	4	
		15	Dull Reddish Brown	3	—	5	3	—	3	4	
		16	" " "	—	—	—	—	—	—	—	
		17	Dull Bluish Red	2	5	4	3	3	3-4	2	
		18	Dull Reddish Brown	3-4	5	5	2-3	3	1-2	4	
		19	Dull Bluish Red	3-4	5	5-6	3	3	2	4	
		20	" " "	3	5	5-6	3	3	3-4	4-5	
		23	Dull Reddish Violet	4	—	5	2	3-4	1	4	
		24	" " "	4-5	—	6	3	—	2	4	
		25	Black	4	—	7	4	—	4-5	4	
		29	Dull Bluish Red	—	5	—	—	3	2-3	4	
		36	Dull Green	—	2-3	—	—	2	2-3	3	
40	37170	2	Bordeaux	4	5	5-6	4-5	2	4	3-4	Silk
		3	"	—	4-5	—	—	2	3	2-3	
		4	"	—	5	—	—	2	3-4	3	
		5	Bright Yellow	—	4	—	—	4	5	4	
		7	Dull Bordeaux	3	5	5	3-4	2-3	3-4	3-4	
		8	Bordeaux	—	4	—	—	2	3-4	3	
		9	Bright Reddish Yellow	5	—	6	4	3	4	3	
		10	Bordeaux	—	4-5	—	—	2-3	2-3	3-4	
		11	"	—	6	—	—	2	4	3	
		12	Dull Bordeaux	6	7	7	4-5	2-3	4	4	
		13	Reddish Navy	—	6-7	—	—	3	4	4	
		14	Bordeaux	—	—	—	—	—	4	4-5	
		15	Dull Reddish Brown	6	—	7	4	2	3	2-3	
		16	Bluish Grey	—	7	—	—	1	3	3	
		17	Bordeaux	—	4	—	—	1-2	3	3	
		18	"	—	4-5	—	—	2	3-4	4	
		19	"	—	6	—	—	1-2	3	3-4	
		20	"	4	6	6	3-4	2	3-4	4	
		24	"	5-6	—	6-7	3-4	2	3	3	
		32	"	3	—	5	5	4	4-5	4-5	
		33	Bright Reddish Yellow	—	4-5	—	—	2	3	3-4	
		36	Navy	—	—	—	—	—	—	—	
41	37165	2	Bright Bluish Violet	3-4	5	5	4-5	3-4*	4	4-5	Silk *AATCC
		3	Dull Bordeaux	2	4	4-5	5	3*	3-4	3	
		4	Dull Reddish Violet	2-3	5	5	4-5	3-4*	3	4-5	
		5	Reddish Yellow	1	2-3	2	4	4*	3-4	3	
		7	Dull Reddish Violet	3	4-5	4-5	4-5	3-4*	2-3	4-5	
		8	" " "	3	4-5	5	4-5	4*	4	4-5	
		10	" " "	3-4	4-5	4-5	4-5	4-5*	3	5	
		11	" " "	3-4	5	5	4-5	3-4*	3-4	4-5	
		12	Bordeaux	2-3	4-5	5	4-5	3*	1	3-4	
		13	Reddish Navy	3-4	5	6	2-3	3*	2	3	
		17	Dull Bordeaux	1-2	4-5	4	3	2-3*	1-2	4-5	
		18	Dull Violet	3	5	5-6	4-5	3-4*	2-3	4-5	
		19	Bluish Red	2-3	5	5	5	2-3*	1	4-5	
		20	Violet	3-4	5	5-6	5	2*	2	5	
		24	Bright Reddish Violet	3-4	—	5-6	4	3-4*	2-3	4	
		25	Black	4	—	6-7	4	—	2-3	3	

# C.I. Azoic Diazo Components

C.I. Azoic Diazo Compo- nent	C.I. Constitu- tion Number or Class	HUES AND FASTNESS ON COTTON									Also suitable for
		C.I. Coupling Compo- nent	Hue	Light ( $\frac{1}{3}$ N) ISO	Light (2N)		Soda Boil	Peroxide	Hot Pressing	Chlorine	
42	37150	2	Bright Red	2	3	3	2	2-3*	4	4	Silk and Nylon *AATCC
		3	Reddish Brown	2-3	3	5	4-5	2-3*	1-2	3	
		4	Bright Red	3	4-5	5-6	4-5	3*	3	5	
		5	Yellow	2-3	4	4	4	4*	4-5	4	
		6	Bright Red	2-3	—	4-5	4-5	—	3	5	
		7	Red	2	3-4	4	3	3*	4	4-5	
		8	Bright Red	3	5	5-6	3-4	2-3*	2	5	
		10	" "	3-4	3	4-5	2-3	2-3*	4	4-5	
		11	" "	3-4	6	5	3	2-3*	3	4	
		12	" "	5-6	7	7	4-5	2-3*	4	5	
		13	Dull Bordeaux	5	6	6-7	4-5	3-4*	4	4	
		15	Brown	5	—	6-7	3-4	2-3*	3-4	3-4	
		16	Dull Brown	5	6	6	3-4	3-4*	3-4	4	
		17	Red	1-2	3	3	2	2-3*	2	4	
		18	Bright Red	3-4	6	5-6	3-4	2-3*	1-2	4-5	
		19	Red	3	5-6	5-6	2	2-3*	3	4	
		20	Bright Yellowish Red	3-4	4	5-6	3	2-3*	3	4-5	
		24	Red	5	—	6-7	4	3*	3-4	4	
		25	Black	4	—	6-7	4-5	—	4	4	
		28	Bright Red	5	—	5-6	3-4	2-3*	4	4	
		32	Red	4	—	6	5	2*	4	4-5	
43	37160	2	Reddish Violet	—	5	—	—	1-2*	4-5	4	Silk *AATCC
		3	Bordeaux	—	3-4	—	—	2-3*	2-3	3	
		4	"	—	5	—	—	2*	2	4	
		5	Yellow	—	2-3	—	—	5*	4	3	
		7	Dull Violet	4	5	5	4	2*	1	4	
		8	Reddish Violet	—	4-5	—	—	2*	2	4	
		9	Bright Reddish Yellow	5	—	5-6	—	—	—	3	
		10	Bluish Violet	4	5	5	—	1-2*	2	5	
		11	Bordeaux	5-6	6-7	6-7	4-5	2*	2-3	4	
		12	Reddish Violet	4-5	6-7	6	4	4*	2	3-4	
		13	Greenish Black	—	6-7	—	—	2*	4	3-4	
		16	Brown	5	6-7	6-7	4-5	4-5*	4	4	
		17	Bordeaux	—	4	—	—	1-2*	2-3	3-4	
		18	Violet	—	4-5	—	—	2*	2-3	4	
		19	Bordeaux	—	5-6	—	—	3*	2	3-4	
		20	Reddish Violet	4-5	6	6	4-5	3*	2	4	
		23	Dull Bluish Red	4-5	—	5-6	4-5	3-4*	2	5	
		24	Bluish Violet	5	—	6-7	4	3-4*	2	4	
		36	Greenish Black	—	3	—	—	1*	2-3	3	
44	37000	2	Yellowish Red	2	5	4	2-3	1*	4	4-5	Silk, Acetate and Nylon *AATCC
		3	Reddish Brown	3	4	5-6	2-3	3*	2	2	
		4	Red	2-3	5	5	2-3	1-2*	2	4-5	
		5	Bright Yellow	4	5	5	4-5	4*	3	3-4	
		6	Bright Reddish Orange	3	—	5	4	—	2-3	5	
		7	Red	3	5	5-6	4	3-4*	3-4	4	
		8	Yellowish Red	2	5	5	3	2*	1-2	4	
		9	Bright Yellow	6	—	6-7	3-4	4-5*	3-4	3-4	
		10	Yellowish Red	2-3	4	4	3-4	1*	3	4-5	
		11	" "	4	6	5-6	2	1*	4	4-5	
		12	" "	4	5	5-6	4-5	2*	1	5	
		13	Dull Reddish Violet	4	7	5-6	3-4	3-4*	1	3-4	
		15	Yellowish Brown	4	—	6	2-3	—	4	4	
		16	" "	—	5	—	—	3*	3-4	4	
		17	Bluish Red	1-2	4	3-4	1-2	1*	1-2	4-5	
		18	Reddish Orange	3-4	5	4-5	3	2*	2-3	4-5	
		19	Yellowish Red	3	5	4-5	2-3	1*	1-2	3-4	
		20	" "	3	4	4	3	1*	2-3	4	
		23	Dull Reddish Orange	4-5	—	5	—	3*	—	4	
		24	" " "	5	—	6	3-4	2*	2	5	
		25	Dull Violet	4	—	6-7	3-4	—	2-3	4-5	
		33	Bright Greenish Yellow	5	—	6	4-5	4*	4-5	3-4	
		34	Orange	4	—	5	—	2-3*	—	4-5	
		36	Bordeaux	—	—	3	—	2*	2-3	3	
		44	Greenish Yellow	—	—	7	4-5	—	3-4	4	

# C.I. Azoic Diazo Components

C.I. Azoic Diazo Component	C.I. Constitution Number or Class	HUES AND FASTNESS ON COTTON									Also suitable for
		C.I. Coupling Component	Hue	Light ( $\frac{1}{3}$ N) ISO	Light (2N) AATCC ISO		Soda Boil	Peroxide	Hot Pressing	Chlorine	
45	37260	2	Black	—	4	—	—	3*	5*	3*	Silk *All AATCC
		3	Brownish Black	—	2	—	—	2	5	2	
		4	Black	—	4	—	—	3	5	3	
		5	Reddish Brown	—	1	—	—	3	3-4	3	
		7	Black	—	3	—	—	3	4-5	3	
		8	"	—	4	—	—	3	5	3-4	
		10	"	—	3	—	—	3	4-5	3	
		11	"	—	4	—	—	3	5	3	
		12	"	—	4	—	—	3	5	3	
		13	"	—	4-5	—	—	3	5	3	
		15	Brownish Black	—	3-4	—	—	4-5	5	3	
		16	"	—	5	—	—	2	2	2-3	
		17	Black	—	4	—	—	3	5	3	
		18	"	—	4	—	—	3	5	3	
		19	"	—	4	—	—	3	4-5	3	
		20	"	—	4	—	—	3	4-5	3	
		29	Brownish Black	—	3-4	—	—	4-5	5	3	
		36	Greenish Black	—	2	—	—	1-2	5	1-2	
46	37080	2	Yellowish Red	—	4	—	5*	2*	4*	4-5*	Silk, Acetate and Nylon *All AATCC
		3	Reddish Brown	—	4	—	5	2-3	3-4	3	
		4	Bright Bluish Red	4-5	5-6	5-6	5	1-2	2	4-5	
		5	Bright Yellow	—	4	—	5	5	5	4	
		7	Bright Yellowish Red	4	5-6	5	3-4	3	4-5	4-5	
		8	"	4	5-6	6	5	3-4	4-5	4-5	
		10	Yellowish Red	—	3-4	—	4	1	4-5	3-4	
		11	Red	—	5	—	5	1	3	4	
		12	Dull Red	5	6-7	6	—	2-3	2-3	3-4	
		13	Dull Bordeaux	—	6-7	—	—	2-3	5	4-5	
		15	Brown	5-6	—	6-7	3	2-3	4-5	4-5	
		16	Yellowish Brown	—	6	—	—	3-4	3	4	
		17	Yellowish Red	—	3	—	5	1	3	4	
		18	Bright Orange	4	5	5	5	2-3	3	4	
		19	Reddish Brown	—	5-6	—	3	2	2-3	4	
		20	Yellowish Red	—	5	—	4	2	4	4	
		24	Bright Red	4-5	—	6	—	1-2	—	4	
		36	Bordeaux	—	3	—	—	2	3	3	
		37	Dull Brown	6	—	6-7	3	3	2	3-4	
47	37250	2	Reddish Navy	—	6	—	—	3*	3*	2-3*	Silk *All AATCC
		3	"	—	3	—	—	2-3	1-2	2	
		4	"	—	5	—	—	3	2	2-3	
		5	Dull Yellowish Orange	—	1-2	—	—	3	3	1-2	
		7	Navy	—	5	—	—	3	2-3	2-3	
		8	"	—	5-6	—	—	3-4	2	2-3	
		10	Blight Reddish Navy	4-5	6-7	6	4-5	3-4	3	3	
		11	Reddish Navy	—	5-6	—	—	2-3	2-3	2	
		12	"	—	5	—	—	2	3	2	
		13	Greenish Black	—	3	—	—	2	4-5	2	
		17	Greenish Navy	5	5-6	6	4-5	1	3	3	
		18	"	—	5-6	—	—	3-4	3	3	
		19	Navy	—	5	—	—	2-3	3-4	2	
		20	Reddish Navy	—	5	—	—	3	3	2	
		36	Green	4	5	5	4	3	4	2	
48	37235	2	Navy	2	4	4	4-5	3-4*	4-5	4	Silk, Acetate, Nylon and Polyester *All AATCC
		3	Brownish Black	1	2	3	5	3	4	2	
		4	Navy	2	4	4	4-5	3	4	4	
		5	Yellowish Brown	1	2	1-2	4	4	4	3-4	
		7	Navy	1-2	4	3	5	4	4-5	4	
		8	"	1	3	3	5	2-3	4-5	3	
		10	"	2	2	3	5	3	3-4	4	
		11	"	1-2	4	3	4	3	3-4	3	
		12	"	—	4	—	—	3-4	4	1-2	
		13	Grey, Black	—	4-5	—	—	4-5	4	3-4	
		16	Dull Brown	—	6	—	—	1-2	3	3	
		17	Reddish Navy	1	4	3	3	3	3-4	4	
		18	Navy	1-2	3	3-4	4-5	2	3-4	4	
		19	"	2	4	4	5	3	3	4	
		20	Reddish Navy	1-2	4	3	4	3-4	3	3	
		23	Dull Bluish Violet	2-3	—	3	—	4	—	3	
		25	Navy	2	—	5-6	5	—	4	3-4	
		29	Reddish Navy	—	4-5	—	—	2-3	—	2-3	
		36	Dull Bluish Green	—	2	—	—	1-2	4	3	



# C.I. Azoic Diazo Components

C.I. Azoic Diazo Component	C.I. Constitution Number or Class	HUES AND FASTNESS ON COTTON									Also suitable for
		C.I. Coupling Component	Hue	Light ( $\frac{1}{2}$ N) ISO	Light (2N)		Soda Boil	Peroxide	Hot Pressing	Chlorine	
49	37050	2	Bright Reddish Orange	4-5	6-7	6	4	2-3	4	4-5	Silk
		3	Reddish Brown	—	5	—	—	2-3	3	3	
		4	Yellowish Red	—	5-6	—	—	2-3	3	4	
		5	Yellow	—	5	—	—	4	1-2	3	
		7	Bright Reddish Orange	4	5-6	5	3	2	4-5	5	
		8	Bright Yellowish Red	5	6	6	4	2	3	4-5	
		9	Bright Reddish Yellow	6-7	—	7-8	3-4	5	3-4	3-4	
		10	Reddish Orange	—	4-5	—	—	2-3	4-5	4-5	
		11	Bright Reddish Orange	5-6	6-7	6-7	3	2-3	3-4	4-5	
		12	Dull Orange	5-6	7	6-7	4	3	3-4	4-5	
		13	Dull Bordeaux	—	6-7	—	—	3-4	3	3-4	
		16	Brownish Olive	4-5	6	5-6	3-4	3	4	3	
		17	Yellowish Red	—	4-5	—	—	2-3	4	4-5	
		18	Bright Yellowish Red	5	6	6	3-4	2-3	2-3	4-5	
		19	Yellowish Red	4-5	6-7	5	4	2	4	4	
		20	Bright Reddish Orange	5-6	7	6-7	4	2	4	4	
		23	Reddish Orange	4-5	—	6	3-4	2	3	3	
		24	Dull Yellowish Red	5	—	6	3-4	2	3	4	
		32	" " "	5	—	7	3-4	1	4-5	2	
		33	Bright Yellow "	6	—	6-7	4-5	4	3	3	
		35	" " "	5	—	6	4	3-4	2-3	2	
		36	Bordeaux	—	—	4	—	2-3	3	3-4	
		37	Olive	5-6	—	6	3-4	3-4	4-5	4-5	
50	—	2	Reddish Navy	—	—	5	4-5	—	4	4	
		42	Bright Yellowish Red	—	—	3-4	4-5	—	4	4	
		44	" " "	—	—	5	4-5	—	4	4	
51	37195	2	Reddish Navy	5-6	—	6-7	4	3-4	—	3-4	
		18	" "	5	—	6	4	3-4	—	3-4	
		20	" "	4-5	—	6	4	3-4	—	3-4	

## C.I. Azoic Diazo Components

C.I. Azoic Diazo Component	C.I. Constitution Number or Class	HUES AND APPLICATION TO SHEEPSKIN, GOAT, FOAL AND RABBIT SKINS			Also suitable for
		C.I. Coupling Component	Hue		
100	—	100 101 102 103	Pink→Bright Yellowish Red Red Brown→Reddish Brown Dull Violet→Reddish Brown	<b>Application</b> The developer is formed into a paste with a little tepid water, if necessary with addition of a dispersing agent, and then dissolved with 10–20 times its weight of water at room temperature The following additions are also made to the bath. For full dyeings 1–1.5 g bicarbonate of soda per litre; for medium to light dyeings 1–2 c.c. acetic acid 50% and 7–10 g sodium acetate per litre, or 4–5 g monosodium phosphate per litre; for light dyeings 4–4.5 g monosodium phosphate per litre	
101	—	100 101 102	Red Red Brown	<b>Application</b> As for Diazo Component 100	
102	—	102 103	Brown Dull Brown	<b>Application</b> As for Diazo Component 100	
103	—	101 102 103	Bright Reddish Orange→Yellowish Orange Dull Yellow→Brown Brown	<b>Application</b> As for Diazo Component 100	
104	—	104	Reddish Navy	<b>Application</b> The developer is formed into a paste with a little tepid water, if necessary with addition of a dispersing agent, and then dissolved with 10–20 times its weight of water at about 35°C The following additions are also made to the bath. For blacks 3 g chromium acetate or cobalt acetate per litre; for blues and greens 4.5 g monosodium phosphate per litre	
105	—	100 103 105	Greenish Navy Black Dull Green	<b>Application</b> The developer is formed into a paste with a little tepid water, if necessary with addition of a dispersing agent, and then dissolved with 10–20 times its weight of water at about 35°C	
106	—	101 104 105	Black Black Green	<b>Application</b> As for Diazo Component 104	
107	—	101 102 103	Reddish Blue Dull Brown Navy	<b>Application</b> As for Diazo Component 105	
108	—	104 105	Blue Green	<b>Application</b> The developer is formed into a paste with a little tepid water, if necessary with addition of a dispersing agent, and then dissolved with 10–20 times its weight of water at about 35°C An addition of 2–3 g chromium acetate per litre is made to the bath	

# C.I. Azoic Diazo Components

C.I. Azoic Diazo Component	C.I. Constitu- tion Number or Class	HUES AND FASTNESS ON COTTON									Also suitable for
		C.I. Coupling Compo- nent	Hue	Light ( $\frac{1}{2}$ N) ISO	Light (2N)		Soda Boil	Peroxide	Hot Pressing	Chlorine	
109	37245	2	Navy	3	—	4	—	—	3-4	2WD	
		4	Reddish Navy	—	—	5	—	—	—	2	
		5	Yellowish Red	1	—	2WD	—	—	1	1R	
		7	Navy	—	—	5	—	—	—	2	
		8	Reddish Navy	—	—	5	—	—	—	2-3	
		10	" "	—	—	5	—	—	—	2	
		11	Navy	3	—	3	—	—	3-4	1	
		12	Reddish Navy	—	—	—	—	—	—	2	
		17	Navy	3	—	3	—	—	3-4	2	
		18	" "	4	—	4-5	—	—	3-4	2	
		19	Reddish Navy	—	—	—	—	—	—	1-2	
		20	Navy	4	—	4	—	—	4-5	2	
		34	Reddish Navy	—	—	—	—	—	—	3	
		110 & 111			These numbers are discontinued						
112	37225	2	Reddish Navy		Light: poor; after treated with copper sulphate and acetic acid at the boil, fairly good						
		7	" "								
		8	" "								
		17	" "								
113	37230	2	Navy		Light: poor; after treated with copper sulphate and acetic acid at the boil, fairly good						
		7	" "								
		8	Reddish Navy								
		17	" "								
114	37265	2	Reddish Violet								
		7	Dull Bordeaux								
		8	" "								
		17	" "								
115 & 116			These numbers are discontinued								
117	37020	2	Dull Bordeaux								
		20	Reddish Brown								
118	—	2	Dull Bluish Green	4	—	5	5	4	3-4	4	
		5	Red	1-2	—	3	4	3-4	3-4		
		18	Bluish Green	3-4	—	5	5	4	4		
119	—	2	Bright Yellowish Red	—	6	—	4*	—	1*	5*	*All AATCC figures
		3	Very Dull Bluish Red	—	4-5	—	4-5	—	1	1	
		4	Dull Red	—	5-6	—	4	—	3	4	
		5	Bright Reddish Yellow	—	5	—	5	—	3	2	
		7	Bright Yellowish Red	—	6	—	5	—	3	5	
		8	Dull Yellowish Red	—	5-6	—	4	—	3	4	
		10	" "	—	5	—	5	—	3	4	
		11	Bright Yellowish Red	—	6	—	5	—	3	5	
		14	Red	—	6	—	—	—	3	5	
		17	Dull Bluish Red	—	5	—	4	—	3	4	
		18	Dull Red	—	6	—	5	—	3	5	
		19	" "	—	6	—	4-5	—	3	5	
		20	Red	—	6	—	4-5	—	3	5	
120	—	4	Red	—	—	5-6	—	2	3	4-5	
		11	"	—	—	6	—	2	3	4-5	
		12	"	—	—	6-7	—	2	3-4	4-5	
		14	Yellowish Red	—	—	5	—	2	3	4-5	
		19	Red	—	—	6-7	—	3	3-4	5	
		20	Yellowish Red	—	—	6	—	2	3	5	
		23	Red	—	—	6	—	2	3-4	5	
		24	"	—	—	6	—	2	3	5	
		28	"	—	—	5-6	—	2	3	4	
		41	Yellowish Red	—	—	5	—	2	3-4	5	
		46	Red	—	—	6	—	2	3	5	
121	—	12	Red	4	—	6	—	3	4	3-4	
		23	"	5	—	6-7	—	3	4	3-4	

# C.I. Azoic Diazo Components

C.I. Azoic Diazo Component	C.I. Constitution Number or Class	HUES AND FASTNESS ON COTTON									Also suitable for
		C.I. Coupling Component	Hue	Light (1/2N) ISO	Light (2N)		Soda Boil	Peroxide	Hot Pressing	Chlorine	
122	—	2	Red	2	—	4	4, 3	3, 3	3-4, 4	4	
		4	Bordeaux	3	—	5	4-5, 3	3, 3	4, 4	4	
		7	Bluish Red	2	—	4	5, 3	3, 3	3, 3-4	3-4	
		8	Red	2	—	4	4, 2	1-2, 2	3-4, 4	3	
		11	"	3	—	5-6	4-5, 3	3, 3	3-4, 3-4	3-4	
		12	"	5	—	6	4-5, 3	1-2, 3	3-4, 3	3	
		16	"	5	—	5-6	4, 3	3-4, 3	4-5, 4-5	4	
		17	"	1	—	3	4, 2-3	2-3, 3	3, 4	3-4	
		18	"	2	—	4-5	4, 1-2	2-3, 2	3, 3-4	3-4	
		20	"	3	—	5	4, 2	2, 2-3	3, 4	4	
		23	Reddish Violet	5	—	6	5, 4	3-4, 3-4	4, 4	4	
		24	—	5	—	6	4-5, 3	3, 3	3-4, 3-4	4	
		28	Red	4	—	6	3, 1-2	1-2, 2	3-4, 3-4	3	
		32	Bordeaux	5-6	—	6	4, 2	1, 3	2, 2	3	
		37	"	4	—	5-6	3, 2-3	3-4, 3	4, 4-5	4	
		41	"	3	—	5	3, 4	2, 3	3-4, 3-4	3-4	
		46	Bluish Red	4	—	6	4-5, 3-4	2, 3	3-4, 3-4	3-4	
123	—	2	Dull Red	3	—	4	3, 3	4, 3	4	3, 4	
		4	Bordeaux	3-4	—	5	3, 3	2, 3	4	2-3, 4-5	
		7	"	3-4	—	6	3, 3	3, 3	4-5	3, 4-5	
		11	"	4-5	—	6	3, 2-3	2, 3	4-5	3, 4-5	
		12	"	5	—	6	3, 3	2, 3	4	3, 5	
		13	Olive	5	—	6	4, 3	2, 3-4	4-5	3, 5	
		16	Reddish Brown	5-6	—	6-7	4, 3	2-3, 2	4-5	3-4, 4-5	
124	—	2	Bluish Violet	4	—	5	5, 5	4, 4	4-5	3-4, 4	
		8	" "	4	—	5-6	5, 5	5, 4-5	4	4-5, 5	
		10	" "	4	—	5	5, 4-5	4-5, 4-5	1-2	4, 5	
		17	" "	4-5	—	5-6	5, 5	5, 5	3-4	4-5, 5	
125	—	18	Violet	4-5	—	5-6	5, 5	5, 5	4-5	4-5, 5	
		2	Olive	3-4	—	5-6	4-5, 4	4, 4	4, 5	4-5	
		7	Brown	4	—	6	5, 3-4	4, 4	4, 4-5	5	
		8	"	3-4	—	5-6	4-5, 4	4, 4-5	4-5, 5	5	
		11	Greenish Brown	5	—	6-7	5, 4	4, 4-5	3, 4	4-5	
		12	Olive	4-5	—	6-7	3-4, 3-4	4-5, 4	5, 5	5	
		14	"	3	—	5-6	5, 4	4, 4-5	5, 5	4-5	
		19	"	4	—	6	5, 4-5	3, 4	4-5, 5	4	
		20	"	3-4	—	5-6	4-5, 3-4	4, 4	4, 5	5	
		23	"	4-5	—	6	3-4, 3-4	3-4, 4	4, 5	4-5	
126		46	Greenish Brown	5	—	6-7	4-5, 4	3, 4-5	4, 5	5	
			This number is discontinued								



# C.I. Azoic Diazo Components

C.I. Azoic Diazo Components	C.I. Constitution Number or Class	HUES AND FASTNESS ON NYLON								Also suitable for
		C.I. Coupling Component	Hue	Light ( $\frac{1}{2}$ N) ISO	Light (2N) AATCC ISO		Washing (100°C)	Hot Pressing	Decatising	
127	Stabilised Diazo salt	3	Bordeaux	4	—	5-6	4-5, 3	5, 5	5	
		4	"	3	—	4	4-5, 3	5, 5	5	
		12	"	3	—	5	4-5, 3-4	5, 5	5	
		14	Bluish Red	3	—	3-4	4-5, 3	5, 5	5	
		15	Brown	4	—	6	3-4, 3	4-5, 5	4-5	
		19	Reddish Violet	3	—	4-5	4-5, 3-4	5, 5	5	
		23	" "	3	—	5	5, 3-4	4-5, 5	5	
		24	Bordeaux "	3	—	4-5	5, 3	5, 5	5	
		32	"	3	—	5	4-5, 3	4-5, 5	5	
128	Stabilised Diazo salt	8	Navy	4	—	4-5	4-5	—	4	Nylon-Cellulosic unions
		12	Reddish Navy	4	—	5-6	4-5	—	3-4	
		13	Bluish Navy	3-4	—	5	4-5	—	4	
		15	Bluish Violet	5	—	6	4-5	—	4	
		18	Navy	3-4	—	4-5	4-5	—	3-4	
		24	"	4	—	5-6	5	—	3-4	
		25	Bluish Navy	4-5	—	5-6	4-5	—	4	
		36	Bluish Green	3	—	4-5	4-5	—	3-4	
129			This number is discontinued							
130	—	As Grey								
		13	Bluish Grey	3-4	—	5	5	—	5	
		25	" "	3-4	—	5	5	—	5	
		As Black								
		13	Black	—	—	6	4-5	—	5	
		25	"	—	—	6	4-5	—	5	

# C.I. Azoic Diazo Components

C.I. Azoic Diazo Component	C.I. Constitution Number or Class	HUES AND FASTNESS ON COTTON								Also suitable for
		C.I. Coupling Component	Hue	Light (1N) ISO	Light (2N) ISO	Soda Boil	Peroxide	Hot Pressing	Chlorine	
131	Stabilised salt	2	Black	—	4-5	4-5	—	4-5	4	
		5	Dull Violet	—	3-4	3-4	—	4	2-3	
		17	Black	—	4-5	4-5	—	4-5	3-4	
		18	"	—	5	4-5	—	4-5	4	
		20	"	—	5	4-5	—	4-5	4	
132	37111	4	Bluish Red	—	5-6	—	2	5	4-5	
		11	Red	—	6	—	2	5	4	
		12	"	—	6-7	—	2	5	4-5	
		14	"	—	5	—	2	5	4-5	
		19	"	—	6-7	—	3	5	4	
		20	Yellowish Red	—	6	—	2	5	5	
		23	Red	—	6	—	2	5	4	
		24	Bluish Red	—	6	—	2	5	4	
		28	Red	—	5-6	—	2	5	3-4	
		41	"	—	5	—	2	5	5	
		46	"	—	6	—	2	5	5	
133		This number discontinued; transferred to C.I. Azoic Diazo Component 118								
134	Stabilised salt (slow coupling)	2	Dull Green	3	5-6	4	4-5	4	4-5	
		18	Olive	2-3	5	3-4	4-5	3-4	3-4	
		20	"	3	5	4	5	3	3-4	
		11	"	4	6	5	5	3-4	3-4	
		19	"	3-4	6	4	4-5	3	4-5	
		46	"	4	6-7	4-5	5	4	3-4	
		41	"	3	5	4	4-5	3	3	
135	Base, suitable for metal complex formation	18/Co	Green	5	6	4-5	4-5	3-4	3-4	
		20/Co	"	5-6	7	4-5	4	4	2	
		12/Co	"	5-6	6-7	4-5	4-5	4	2	
		15/Co	Bluish Grey	6	7	4-5	4-5	3-4	3-4	
		36/Co	Olive	5-6	6	5	4-5	4	1-2	
		12/Cu	Dull Blue	6	7-8	2	4-5	3-4	4	
		15/Cu	Navy	6-7	7-8	2	4-5	4-5	4-5	
		36/Cu	Green	6	7	4-5	4	4-5	3	
136	Base or salt, suitable for metal complex formation	2/Cu	Brown	6-7	7	—	4	4-5	4	
		7/Cu	"	7	7-8	—	4	3-4	4-5	
		10/Cu	"	7	7-8	—	4-5	3-4	4-5	
		12/Cu	"	6-7	7	—	4-5	4	4-5	
		14/Cu	"	6	7	—	4-5	4-5	4	
		17/Cu	"	7	7-8	—	4-5	4-5	4-5	
137	Base or salt, suitable for metal complex formation	2/Cu	Brown	6	7-8	—	4-5	4	4	
		7/Cu	"	6	7	—	5	3-4	4	
		10/Cu	"	6	7-8	—	4-5	3-4	4	
		13/Cu	"	6	7	—	4	3-4	4	
		17/Cu	"	6	7	—	4-5	3-4	4	
		20/Cu	"	6	7	—	4-5	3-4	4	
		28/Cu	"	6	7	—	4	3-4	4	
138		This number discontinued; transferred to C.I. Azoic Diazo Component 135								
139		For Hue and Fastness figures, see C.I. Azoic Black 23								
140	—	2	Bluish Red	—	5*	3	—	3	5	Silk, Acetate, Nylon and Polyester *At N depth
		4	Reddish Violet	—	7*	3	—	2	5	
		5	Orange	—	4*	3	—	3-4	3-4	
		7	Violet	—	6-7*	3	—	2	4	
		8	Reddish Violet	—	6-7*	3	—	3	5	
		10	Bluish Red	—	5-6*	2-3	—	2-3	5	
		12	Reddish Violet	—	6-7*	—	—	—	4	
		14	Bluish Red	—	6*	4	—	3	4	
		17	Dull Bordeaux	—	4*	3	—	4	4-5	
		18	Bluish Red	—	5*	3	—	3-4	5	
		20	Bordeaux	—	7*	4	—	3	5	

# C.I. Azoic Coupling Components

C.I. Azoic Coupling Component	C.I. Constitution Number	Affinity	Optimum Dyeing Conditions		Padding Temp. (°C)	Dissolving Method	Recommended Diazo Components, and Notes
			Salt (g/l)	Temp. (°C)			
1	37500	Low	High	—	—	1	Historically used with 37, and $\alpha$ -naphthylamine
2	37505	Low	20	30	90	1, 2	1-14, 16, 17, 19, 20, 22, 24, 26, 27, 31-48, 50, 51, 109, 118, 124, 125, 131, 134, 136, 137, 140
3	37575	High	0	25-50	70-80	1, 2	1-14, 22, 24, 26, 32-48
4	37560	Medium	20	25-45	70-80	1, 2	1-14, 16, 20, 22, 24, 26, 27, 30, 32-48, 109, 119, 120, 122, 135, 140
5	37610	Medium	15	25-45	40-80	1, 2	1-14, 22, 24, 26, 32-48, 131
6	37532	Medium	20	20-25	90	1, 2	1-13, 32, 34-39, 41, 42, 44, 48
7	37565	High	10	40	90	1, 2	1-16, 19-27, 30, 33-48, 109, 119, 122, 134-137, 140
8	37525	Medium	20	30	90	1, 2	1-14, 16, 18-20, 22, 24, 32, 34-48, 109, 119, 122, 135, 140
9	37625	Low	20	25	50	1	3, 5, 11, 31, 32, 33, 40, 43, 44
10	37510	Medium	20	30	90	1, 2	1-14, 16, 17, 19, 20, 22, 24, 32-48, 137, 140
11	37535	Medium	20	25-45	70-80	1, 2	1-14, 18-22, 24, 31-48, 134
12	37550	Medium	20	30	90	1, 2	1-14, 18-20, 22, 24, 26-48, 134-136, 140
13	37595	High	0	30	90	1, 2	1-14, 20, 22, 24, 32-48, 137
14	37558	Low	20	25-40	70-80	1, 2	9, 32, 34, 36, 40, 136, 140
15	37600	High	20	30	90	1, 2	1-12, 15, 26, 32, 34-42, 44, 45, 46, 48, 135
16	37605	High	—	30	90	1, 2	1, 2, 4, 7, 8, 10, 11, 14, 16, 17, 22, 24, 31-36, 38-40, 42-46, 48
17	37515	Medium	20	25-45	70-80	1, 2	1-5, 7-14, 20-24, 32-48, 131, 134, 136, 137
18	37520	Low	20	25-45	70-80	1, 2	1-14, 16, 19, 20, 22, 24, 32-48, 51, 131, 134, 135, 140
19	37545	Medium	20	30	90	1, 2	1-14, 20, 22-24, 26-27, 31-48, 135
20	37530	Low	20	25-45	70-80	1, 2	1-14, 16, 18, 20, 22, 24, 26, 30-48, 51, 131, 135-137, 140
21	37526	Low	20	30	90	1, 2	—
22	37511	Medium	—	30	90	1, 2	—
23	37555	High	—	30	90	1, 2	2, 4-13, 16, 17, 19, 26, 30-34, 36, 37, 39, 43, 44, 48, 134, 135
24	37540	Medium	20	30	90	1, 2	1-5, 8-13, 18, 20, 23, 24, 27, 31-44, 46, 48, 134
25	37590	High	0	30	90	1, 2	1-5, 8-13, 20, 32-39, 41, 42, 44, 48
26	—	High	20	30	90	1, 2	1-5, 9-13, 32, 34, 36
27	37516	Low	—	30	—	1, 2	—
28	37541	High	—	30-40	90	1, 2	10-12, 17, 32, 42, 120, 122, 135, 137
29	37527	Low	—	30	90	1, 2	1, 2, 7, 8, 10, 11, 14, 35, 38, 39, 45, 48
30	37559	Medium	—	30	90	1, 2	21. Coupling Component 46 is also C.I. 37559
31	37521	Medium	—	30	90	1, 2	—
32	37580	High	0	—	90	1, 2	5, 6, 8, 9, 11, 16, 17, 30, 33, 34, 37, 42
33	37620	High	0	30	90	1, 2	2, 26, 32, 33, 36, 40, 44
34	37531	Medium	—	30	—	1, 2	1-4, 6, 9, 36, 37, 44, 109. Coupling Components 41 is also C.I. 37531

# C.I. Azoic Coupling Components

C.I. Azoic Coupling Component	C.I. Constitution Number	Affinity	Optimum Dyeing Conditions		Padding Temp. (°C)	Dissolving Method	Recommended Diazo Components, and Notes
			Salt (g/l)	Temp. (°C)			
35	37615	High	0	30	90	1, 2	5, 26, 33, 36
36	37585	High	0	30	90	1, 2	1, 2, 7, 8, 10, 11, 14, 20, 22, 24, 33, 35, 38-40, 43-48, 135
37	37608	High	0	30-40	90	1	3, 10-12, 46, 49
38	—	Developed for nylon. Not currently manufactured				3	Naphtol AS-GP
39	—	Developed for nylon		—	—	3	—
40	37570	—	—	—	—	1, 2	3, 9, 33
41	37531	Medium	—	20	—	1, 2	9, 13, 19, 32, 33. See Coupling Component 34
42	37611	Low	—	—	50	1, 2	1, 5, 30, 34, 38, 50. Not currently manufactured
43	—	Medium	—	—	90	2	3, 5, 10, 11, 36, 44
44	37613	Low	—	—	50	1, 2	11, 16, 36, 38, 44, 50
45	37566	Medium	—	30	90	1, 2	30. Not currently manufactured
46	37559	Medium	—	50	90	1, 2	21. See Coupling Component 30
100	—	—	20	35-38 on Sheep skins, goat, calf, foal and rabbit skins			100, 101, 103, 105, 107
101	—	—	20	35-38 on Sheep skins, etc.			100, 101, 106
102	—	—	20	35-38 on Sheep skins, etc.			100, 101, 102, 103, 107
103	—	—	20	35-38 on Sheep skins, etc.			100, 102, 103, 104, 105, 107
104	—	—	20	35-38 on Sheep skins, etc.			104, 106, 108
105	—	—	20	35-38 on Sheep skins, etc.			105, 106, 108
107	37107	High	—	—	90	1, 2	3, 5, 7, 11, 12, 15, 17, 25, 26, 32, 33, 36, 42-44, 46, 49
108	—	Very low	—	—	50	2 (add water before NaOH)	3, 11, 32, 40, 44, 46, 49
109	—	—	—	—	—	—	Diacelliton Fast Black D Super Fine (MCI)
110	This C.I. Generic Name is discontinued. The Product is now listed under C.I. Azoic Coupling Component 18						
111	37568	Medium	20	30	90	1, 2	1, 3, 6, 7, 8, 12, 13, 34, 36, 38, 44, 49, 120
112	37569	High	10	30	90	1, 2	1, 6-13, 17, 32, 34, 36, 49, 120
113	37567	Medium	20	30	90	1, 2	1, 2, 3, 5, 6, 8-18, 20, 22, 24, 26, 27, 31-36, 38-45, 51





**C.I. Azoic Yellow 1—(28)**

C.I. Azoic Yellow	C.I. Coupling Component	C.I. Diazo Component	Hue  (Fibre)	Fastness				
				Light ( $\frac{1}{3}$ N) AATCC ISO		Light (2N) AATCC ISO		Washing
1	37610	37090	Yellow (Cotton)	3-4	4	4	5	5
1:1	Similar in hue, application and properties to C.I. Azoic Yellow 1, but slightly different chemically							
2	37610	37120	Greenish Yellow (Cotton)	3	—	4-5	4-5	5
3	37610 + 37558	37090	Reddish Yellow „	3	—	3-4	—	4*
4	This C.I. Generic Name is discontinued. The products formerly listed under it are now listed under C.I. Azoic Yellow 2							
5	—	—	Yellow (Cotton)	—	—	6-7	—	4-5*
6	37614	37120	Reddish Yellow (Cotton)	4-5	5-6	6-7	7	4-5
7	37610	37010	Bright Yellow „	—	—	—	5-6	5
8	This C.I. Generic Name is discontinued. The products formerly listed under it are now listed under C.I. Azoic Yellow 11							
9	37625*	37090	Bright Yellow (Cotton)	—	—	—	6-7	4-5
10	37558	37120	Bright Reddish Yellow „	—	—	—	7	5
11	37613	37085	Greenish Yellow (Cotton)	5-6	6-7	7	7	4-5
11:1	Similar in hue, application and properties to C.I. Azoic Yellow 11, but slightly different chemically							
12	37610	37080	Greenish Yellow (Cotton)	—	2	—	4	4-5
13	—	—	Reddish Yellow „	—	4	—	5-6	5
14	—	—	Greenish Yellow „	—	—	—	5-6	5
15	—	—	Bright Yellow „	—	—	—	4-5	5
16	—	—	Greenish Yellow „	—	—	—	6	5
17	—	—	Bright Greenish Yellow „	—	3	—	7-8	5
18	—	—	Reddish Yellow „	—	1-2	—	5-6	5
19	—	—	Yellow „	—	—	—	6	4-5
20	—	—	Greenish Yellow „	—	—	—	6-7	4-5
21	—	—	Reddish Yellow „	—	—	—	6-7	5
22	This C.I. Generic Name is discontinued							
23	—	—	Greenish Yellow	—	—	—	—	—
24	—	—	Reddish Yellow	—	—	—	—	—
25	—	—	Bright Greenish Yellow	—	—	—	—	—
26	—	—	Bright Greenish Yellow	—	—	—	—	—
27	—	—		—	5	—	6-7	5
28	37610	37235		—	—	—	4	4-5

C.I. Azoic Yellow	Fastness			Development	Notes
	Chlorine	Hot Pressing	Rubbing		
1	4-5	5*	—	Steam or wet	*AATCC tests
1:1					
2	4	5*	—	Steam or wet	*AATCC tests. Suitable for silk
3	4*	5*	—	Acid steam or wet	*AATCC tests
4	—	—	—		
5	4-5*	5*	—	Acid steam or wet	*AATCC tests
6	4-5	5*	—	Steam or wet	*AATCC tests
7	3-4	—	—	Acid steam or wet	Suitable for silk
8					
9	4	—	—	Steam or wet	*Some references say 5-methoxy derivative
10	4-5	—	—	Acid steam or wet	Suitable for silk
11	4-5	5*	—	Steam or wet	*AATCC tests. Suitable for silk
11:1					
12	4	—	—	Steam or wet	
13	4	—	—	" "	
14	4	—	—	Acid steam or wet	
15	4	—	—	" " "	
16	5	—	—	" " "	
17	4-5	—	—	Steam or wet	
18	4-5	—	—	" "	
19	4	—	—	" "	
20	4-5	—	—	" "	
21	5	—	—	" "	
22	—	—	—		
23	—	—	—	Acid steam	
24	—	—	—	" "	
25	—	—	—	" "	
26	—	—	—	" "	
27	4-5	5	—	Steam or wet	
28	1	—	—	" "	

# C.I. Azoic Orange 1—(24)

C.I. Azoic Orange	C.I. Coupling Component	C.I. Diazo Component	Hue (Fibre)	Fastness				
				Light ( $\frac{1}{3}$ N)		Light (2N)		Washing
				AATCC	ISO	AATCC	ISO	
1	37505	37025	Bright Orange (Cotton)	—	—	—	5	4
2	37520	37005	Reddish Orange "	4-5	4-5	5	5	4
3	37558	37010	Reddish Orange "	—	4-5	—	6-7	4
3:1	Similar in hue, application and properties to C.I. Azoic Orange 3, but slightly different chemically							
4	—	—	Reddish Orange (Cotton)	4	—	5	—	4*
5	37530	37050	Reddish Orange (Cotton)	—	5	—	7	4
6	37530	37045	Yellowish Orange "	—	5-6	—	6-7	4
7	37520	37005	" "	—	—	—	5	4
8	37558	37010	Bright Reddish Orange "	4-5	—	5	6	4-5
9	—	—	Reddish Orange "	—	—	4	—	4-5*
10	37505	37050	Bright Reddish Orange "	—	—	—	6-7	5
11	—	—	Dull Yellowish Orange "	—	5-6	—	7	5
12	—	—	Bright Yellowish Orange "	—	—	—	6-7	5
13	—	—	Dull Reddish Orange "	—	—	—	5	5
14	—	—	Bright Orange "	—	4-5	—	6-7	5
15	—	—	Yellowish Orange "	—	—	—	5	4
16	—	—	Bright Orange "	—	—	—	5	4
17	—	—	Bright Reddish Orange "	—	4-5	—	6-7	5
18	—	—	(Acetate)	—	5	—	6	5
19	This C.I. Generic Name is discontinued. The products formerly listed under it are now listed under C.I. Azoic Orange 5							
20	—	—	Bright Orange (Cotton)	—	—	—	—	—
21	—	—	" "	—	4	—	5-6	5
22	—	—	Orange (Polyester)	—	5	—	6	5
23	37610+	37090	(Cotton)	—	4	—	4-5	5
24	37558	—	Orange (Polyester)	—	4-5	—	5-6	4-5



C.I. Azoic Orange	Fastness			Development	Notes
	Chlorine	Hot Pressing	Rubbing		
1	4	—	—	Acid steam or wet	
2	4-5	5*	—	Steam or wet	*AATCC tests
3	4	5*	—	” ”	*AATCC tests
3:1					
4	3-4*	5*	—	Acid steam or wet	*AATCC tests
5	4	—	—	Steam or wet	
6	4	—	—	” ”	
7	4-5	—	—	Acid steam or wet	
8	4	5*	—	” ” ”	*AATCC tests. Suitable for silk
9	3-4*	—	—	” ” ”	*AATCC tests
10	4-5	—	—	” ” ”	Suitable for silk
11	4-5	—	—	Steam or wet	
12	4-5	—	—	Acid steam or wet	Suitable for silk
13	4	—	—	Neutral steam	Suitable for silk
14	5	—	—	Steam or wet	
15	4	—	—	Acid steam or wet	
16	5	—	—	” ” ”	
17	5	—	—	Steam or wet	
18	5	—	5	Hot water, after dyeing and diazo- tising	Suitable for nylon
19					
20	—	—	—	Acid steam	
21	3	5	—	Steam or wet	Resists under Aniline Black and Vat dyes
22	5	5	—	Dye, then diazotise at 80°	
23	3-4	—	—	Steam	
24	5	4	5	See C.I. Azoic Orange 22	Suitable for cotton and acetate

**C.I. Azoic Red 1—(45)**

C.I. Azoic Red	C.I. Coupling Component	C.I. Diazo Component	Hue  (Fibre)	Fastness				Washing
				Light (1N)		Light (2N)		
				AATCC	ISO	AATCC	ISO	
1	37558	37090	Red (Cotton)	4	4-5	5-6	6	5
1:1	Similar in hue, application and properties to C.I. Azoic Red 1, but slightly different chemically							
2	37530	37120	Red (Cotton)	4	4	5	5	5
3	—	—	Bright Yellowish Red "	—	—	—	6	5
4	37505	37110	Bright Red "	—	—	—	6	5
5	37505	37125	Bluish Red "	—	—	—	5	5
6	37520	37090	Red "	4	4	4-5	5	5
6:1	Similar in hue, application and properties to C.I. Azoic Red 6, but slightly different chemically							
7	37505	37035	Red (Cotton)	—	—	—	5	3
8	37530	37010	Bright Yellowish Red (Cotton)	4-5	5	6	7	5
9	This C.I. Generic Name is discontinued. The product formerly listed under it are now listed under C.I. Azoic Red 8							
10	—	—	Red (Cotton)	4	—	5	—	5*
11	—	—	Yellowish Red (Cotton)	4-5	—	5-6	—	5*
12	37550	37150	Bluish Red "	5-6	5-6	6-7	6-7	5
13	—	—	Red "	2-3	—	3-4	—	4-5*
14	—	—	Bright Red "	4	—	4-5	—	5*
15	—	—	Bluish Red "	2-3	—	3-4	—	4-5*
16	37520	37100	Bordeaux "	2-3	4-5	4-5	5-6	4-5
17	This C.I. Generic Name is discontinued. The products formerly listed under it are now listed under C.I. Azoic Red 1							
18	This C.I. Generic Name is discontinued. The products formerly listed under it are now listed under C.I. Azoic Red 2							
19	This C.I. Generic Name is discontinued. The products formerly listed under it are now listed under C.I. Azoic Red 6							
20	This C.I. Generic Name is discontinued. The products formerly listed under it are now listed under C.I. Azoic Red 24							
21	37505	37010	Bright Red (Cotton)	—	—	—	5-6	5
22	—	—	" "	4-5	—	5-6	—	5*
23	37546	37085	" "	—	—	—	6-7	5
24	37560	37125	Bordeaux "	5	5	6	6-7	5
25	37505	37080	Bright Yellowish Red "	—	4	—	5	5
26	37555	37111	Red "	5-6	5	6	6-7	5
27	37530	37090+ 37005	Bright Red "	—	4	—	5-6	5
28	37515	37120	Bordeaux "	—	—	—	4	5
29	37530	37090	Bright Red "	—	4	—	6	5
30	37560	37080	Bluish Red "	—	4	—	5-6	5
31	37505	37040	" "	—	—	—	6-7	5
32	This C.I. Generic Name is discontinued. The products formerly listed under it are now listed under C.I. Azoic Red 29							
33	37550+ 37560	37080	Red (Cotton)	—	4	—	5-6	5
34	—	—	" "	—	5	—	6-7	5
35	—	—	Bluish Red "	—	4	—	5	4
36	—	—	Bordeaux "	—	4-5	—	6-7	5
37	—	—	Bluish Red "	—	—	—	4	5
38	—	—	Yellowish Red "	—	—	—	6-7	5
39	—	—	Bright Red "	—	—	—	5-6	5
40	—	—	Bluish Red "	—	—	—	5-6	5
41	This C.I. Generic Name is discontinued. The products formerly listed under it are now listed under C.I. Azoic Red 4							
42	This C.I. Generic Name is discontinued. The products formerly listed under it are now listed under C.I. Azoic Red 2							
43	This C.I. Generic Name is discontinued. The products formerly listed under it are now listed under C.I. Azoic Red 6							
44	This C.I. Generic Name is discontinued. The products formerly listed under it are now listed under C.I. Azoic Red 28							
45	—	—	Bright Red (Cotton)	—	4-5	—	6-7	5

C.I. Azoic Red	Fastness			Development	Notes
	Chlorine	Hot Pressing	Rubbing		
1	5	5*	—	Steam or wet	*AATCC tests. Suitable for silk
1:1					
2	4-5	5*	—	" "	*AATCC tests. Suitable for silk
3	4	—	—	Acid steam or wet	
4	4-5	—	—	" " "	
5	4-5	—	—	" " "	
6	5	5*	—	Steam or wet	*AATCC tests. Suitable for silk
6:1					
7	3	—	—	Acid steam or wet	
8	5	5*	—	" " "	*AATCC tests
9					
10	5*	5*	—	" " "	*AATCC tests
11	5*	5*	—	" " "	*AATCC tests
12	5	5*	—	Steam or wet	*AATCC tests. See C.I. Pigment Red 5, C.I. 12490
13	3-4*	5*	—	Acid steam or wet	*AATCC tests
14	4*	5*	—	" " "	*AATCC tests
15	3-4*	5*	—	" " "	*AATCC tests
16	4-5	5*	—	Steam or wet	*AATCC tests. See C.I. Pigment Red 12, C.I. 12385
17					
18					
19					
20					
21	5	—	—	Acid steam or wet	Suitable for silk. See C.I. Pigment Red 2, C.I. 12310
22	4-5*	—	—	" " "	*AATCC tests
23	5	—	—	" " "	Suitable for silk
24	4	5*	—	Steam or wet	*AATCC tests. Suitable for silk
25	4-5	—	—	" "	Suitable for silk
26	3	5*	—	" "	*AATCC tests
27	5	—	—	" "	
28	4-5	—	—	" "	Suitable for silk
29	5	—	—	" "	
30	4-5	—	—	" "	
31	4	—	—	Acid steam or wet	
32					
33	4-5	—	—	Steam or wet	
34	5	—	—	" "	
35	5	—	—	" "	
36	5	—	—	" "	
37	4-5	—	—	Acid steam or wet	
38	5	—	—	" " "	
39	5	—	—	" " "	
40	5	—	—	" " "	
41					
42					
43					
44					
45	5	—	—	Steam or wet	

# C.I. Azoic Reds (46—90)

C.I. Azoic Red	C.I. Coupling Component	C.I. Diazo Component	Hue  (Fibre)	Fastness				
				Light ( $\frac{1}{3}$ N) AATCC      ISO		Light (2N) AATCC      ISO		Washing
46	This C.I. Generic Name is discontinued. The products formerly listed under it are now listed under C.I. Azoic Red 12							
47	This C.I. Generic Name is discontinued. The products formerly listed under it are now listed under C.I. Azoic Red 2							
48	This C.I. Generic Name is discontinued. The products formerly listed under it are now listed under C.I. Azoic Red 1							
49	This C.I. Generic Name is discontinued. The products formerly listed under it are now listed under C.I. Azoic Red 6							
50	—	—	Bright Red (Cotton)	—	5	—	6-7	5
51	—	—	Bright Bluish Red "	—	4-5	—	6	4
52	—	—	Bordeaux "	—	2	—	3	4-5
53	—	—	Bluish Red "	—	3	—	4	4-5
54	This C.I. Generic Name is discontinued. The products formerly listed under it are now listed under C.I. Azoic Red 9							
55	This C.I. Generic Name is discontinued. The products formerly listed under it are now listed under C.I. Azoic Red 1							
56	—	—	Bright Red (Cotton)	—	4	—	5-6	4-5
57	—	—	Bright Bluish Red "	—	4	—	5	5
58	—	—	Bluish Red "	—	4-5	—	5	4-5
59	—	—	" "	—	5	—	6	5
60	—	—	" " (Acetate)	—	5	—	5-6	5
61	—	—	" "	—	5-6	—	6-7	5
62	—	—	" "	—	5-6	—	6-7	5
63	—	—	" "	—	4	—	5	5
64	—	—	" "	—	4-5	—	5-6	5
65	—	—	Red (Cotton)	—	5-6	—	6-7	—
66	—	—	Bluish Red "	—	4	—	5-6	—
67	—	—	Bright Red (Acetate)	—	—	—	6	4
68	—	—	Yellowish Red "	—	—	—	5	4-5
69	—	—	Red (Cotton)	—	—	—	—	—
70	—	—	Bordeaux "	—	—	—	—	—
71	—	—	Bluish Red (Cotton)	—	5	—	5	5
72	—	—	Bright Red "	—	4	—	4-5	5
73	—	—	" "	—	—	6	—	4*
74	—	—	" "	—	—	5-6	—	4*
75	—	—	" "	—	4	—	6	5
76	—	—	Bright Yellowish Red "	—	4-5	—	6-7	5
76:1	Similar in hue, application and properties to C.I. Azoic Red 76, but slightly different chemically							
77	—	—	Bordeaux (Acetate)	—	—	—	6	3
78	—	—	Bluish Red (Cotton)	—	4	—	6	5
79	—	—	" " (Polyester)	—	6	—	7	5
80	—	—	Bright Red "	—	6	—	7	5
81	—	—	" "	—	5	—	6	5
82	—	—	Bright Yellowish Red "	—	5-6	—	6-7	5
83	37560	37136	Bluish Red (Cotton)	—	4-5	—	5-6	5
84	—	—	" "	—	2	—	5	4-5
85	—	—	" "	—	—	6-7	—	5*
86	37515	37130	Red "	—	3-4	—	—	2-3
87	—	—	Bright Red (Polyester)	—	—	—	5-6	5
88	—	—	Reddish Bordeaux "	—	—	—	6	5
89	—	—	Bluish Bordeaux "	—	—	—	6	5
90	—	—	Dull Bordeaux "	—	—	—	6-7	5



C.I. Azoic Red	Fastness			Development	Notes
	Chlorine	Hot Pressing	Rubbing		
46					
47					
48					
49					
50	5	—	—	Steam or wet	
51	5	—	—	" "	
52	4-5	—	—	" "	
53	4-5	—	—	" "	
54					
55					
56	4-5	—	—	Steam or wet	
57	5	—	—	" "	
58	4-5	—	—	" "	
59	4	—	—	" "	
60	5	—	3	Hot water, after dyeing and diazo- tising	Suitable for nylon
61	5	—	3	" " " "	Suitable for nylon
62	5	—	5	" " " "	Suitable for nylon
63	5	—	5	" " " "	Suitable for nylon
64	4	—	4-5	" " " "	Suitable for nylon
65	4-5	—	—	Acid steam or wet	
66	3-4	—	—	" " "	
67	5	5	—	Dye and diazotise	Fastness on nylon: Chlorine 4; Light 3; Perspiration 5; Washing 4-5
68	4-5	4-5	—	Dye and diazotise	Fastness on nylon: Chlorine 4-5; Light 3; Perspiration 5; Washing 5
69	—	—	—	Acid steam	
70	—	—	—	" "	
71	5	5	—	Steam or wet	Chlorinated wool, resists under Aniline Black or Vat dyes
72	5	5	—	" "	Resists under Aniline Black or Vat dyes
73	4*	5*	—	Acid steam	*AATCC tests. Artificial light: Yellower
74	3*	5*	—	" "	*AATCC tests. Artificial light: Yellower
75	—	5	4	Steam or wet	
76	—	5	4	" "	
76:1					
77	4-5	5	—	Dye and diazotise	Fastness on nylon: Chlorine 4; Light 4-5; Perspiration 5; Washing 5
78	5	4	—	Acid steam or wet	
79	4-5	5	—	Dye from organic solvent bath, di- azotise at 80°	
80	4-5	5	—	" " " "	
81	4-5	5	—	" " " "	
82	5	5	—	" " " "	
83	5	—	—	Steam	
84	5	4-5	—	Steam or wet	Crease resist finishes, improved light fastness
85	—	4*	—	Acid steam	*AATCC tests
86	4-5	—	—	Steam or wet	
87	5	5	—	Dye at 120°, diazotise at 110°	Fastness to chlorite 2-3; solvents 5
88	5	5	—	" " " "	Fastness to chlorite 4-5; solvents 5
89	5	5	—	" " " "	Fastness to chlorite 2-3; solvents 5
90	5	5	—	" " " "	Fastness to chlorite 2-3; solvents 5

# C.I. Azoic Violet 1—(12)

C.I. Azoic Violet	C.I. Coupling Component	C.I. Diazo Component	Hue (Fibre)	Fastness				
				Light (½N)		Light (2N)		Washing
				AATCC	ISO	AATCC	ISO	
1	37505	37165	Violet (Cotton)	2-3	3	4-5	5	5
1:1	Similar in hue, application and properties to C.I. Azoic Violet 1, but slightly different chemically							
2	37560	37136	Reddish Violet (Cotton)	3-4	4	4-5	5-6	5
3	37540	37160	Violet „ „	4	5-6	4-5	6-7	5
4	—	—	(Acetate)	—	5-6	—	7	5
5	37530	37160	Dull Violet (Cotton)	—	4	—	6	5
6	This C.I. Generic Name is discontinued. The products formerly listed under it are now listed under C.I. Azoic Violet 1							
7	This C.I. Generic Name is discontinued. The products formerly listed under it are now listed under C.I. Azoic Violet 3							
8	This C.I. Generic Name is discontinued. The products formerly listed under it are now listed under C.I. Azoic Violet 1							
9	—	—	Reddish Violet (Cotton)	—	3-4	—	4	5
10	—	—	„ „ „	2-3	—	4-5	—	5*
11	—	—	Dull Reddish Violet (Polyester)	—	—	—	7	5
12	37525	37165	„ „ „ (Cotton)	—	4	—	5-6	5

C.I. Azoic Violet	Fastness			Development	Notes
	Chlorine	Hot Pressing	Rubbing		
<b>1</b>	4-5	5*	—	Steam or wet	*AATCC tests
<b>1:1</b>					
<b>2</b>	5	5*	—	Steam or wet	*AATCC tests
<b>3</b>	4	1*	—	" "	*AATCC tests
<b>4</b>	5	—	4	Hot water, after dyeing and diazo- tising	Suitable for nylon
<b>5</b>	4	—	—	Steam or wet	Suitable for silk
<b>6</b>					
<b>7</b>					
<b>8</b>					
<b>9</b>	4	5	—	Steam or wet	Suitable for wool, resists under Aniline Black
<b>10</b>	3*	5*	—	Acid steam	*AATCC tests
<b>11</b>	5	5	—		
<b>12</b>	3	4-5	—	Steam	

# C.I. Azoic Blue 1—(36)

C.I. Azoic Blue	C.I. Coupling Component	C.I. Diazo Component	Hue (Fibre)	Fastness				
				Light (1N)		Light (2N)		Washing
				AATCC	ISO	AATCC	ISO	
1	37505	37255	Bright Blue (Cotton)	—	—	—	6	4-5
2	—	—	Blue "	2	—	4	—	4-5*
3	—	—	" "	2-3	—	4	—	5*
4	—	—	Reddish Navy "	3	—	4-5	—	4-5*
5	—	—	Blue "	2-3	—	4	—	5*
6	37505	37175	" "	2-3	4	4	5	5
6:1	Similar in hue, application and properties to C.I. Azoic Blue 6, but slightly different chemically							
7	37505	37155	Reddish Blue (Cotton)	2-3	4	4-5	5	5
8	37505	37235	" "	1	1-2	2	4	5
9	This C.I. Generic Name is discontinued. The products formerly listed under it are now listed under C.I. Azoic Blue 8							
10	37560	37175+ 37155	Reddish Navy (Cotton)	—	4-5	—	5	5
10:1	Similar in hue, application and properties to C.I. Azoic Blue 10, but slightly different chemically							
11	This C.I. Generic Name is discontinued. The products formerly listed under it are now listed under C.I. Azoic Blue 1							
12	37520	37255	Reddish Navy (Cotton)	—	—	—	6	5
13	37520	37240	Dull Reddish Blue "	—	—	—	5	5
14	—	—	Navy "	—	2	—	3	5
15	—	—	Reddish Navy "	—	—	—	2-3	5
16	37505	37175+ 37155	" " "	3-4	—	5-6	—	5
17	This C.I. Generic Name is discontinued. The products formerly listed under it are now listed under C.I. Azoic Blue 7							
18	This C.I. Generic Name is discontinued. The products formerly listed under it are now listed under C.I. Azoic Blue 8							
19	—	—	Greenish Blue (Cotton)	—	4	—	5-6	5
20	—	—	Reddish Navy "	—	4	—	5-6	5
21	—	—	" " "	—	—	—	5	5
22	—	—	" (Acetate)	—	3	—	4-5	5
23	—	—	" "	—	3	—	4	5
24	—	—	" "	—	3	—	4	5
25	—	—	Blue (Cotton)	—	4-5	—	6	—
26	—	—	" "	—	5	—	6	—
27	37530	37255	Greenish Navy "	—	3	—	5-6	4
28	—	—	Bright Blue (Acetate)	—	—	—	3-4	5
29	—	—	Navy (Cotton)	—	—	—	6-7	5
30	—	—	Bluish Navy (Polyester)	—	—	—	6	5
31	—	—	Reddish Navy "	—	—	—	6-7	5
32	—	—	Reddish Blue (Cotton)	—	4	—	6-7	4-5
33	37505	37077	" "	—	—	—	3	4-5
34	—	—	Reddish Navy (Polyester)	—	—	—	6	5
35	—	—	Greenish Navy "	—	—	—	6	5
36	—	—	Reddish Navy (Cotton)	—	—	—	3	4-5



C.I. Azoic Blue	Fastness			Development	Notes
	Chlorine	Hot Pressing	Rubbing		
1	3	—	—	Steam	
2	2-3*	5*	—	Acid steam or wet	*AATCC tests
3	3-4*	5*	—	" " "	*AATCC tests
4	2-3*	5*	—	" " "	*AATCC tests
5	3-4*	5*	—	" " "	*AATCC tests
6	4	3*	—	Steam or wet	*AATCC tests
6:1					
7	4	3*	—	Steam or wet	*AATCC tests
8	5	5*	—	Acid steam or wet	*AATCC tests. Suitable for silk
9					
10	4	—	—	Steam or wet	
10:1					
11					
12	3	—	—	Neutral steam	Suitable for silk
13	3	—	—	" "	Suitable for silk
14	4	—	—	Steam	
15	4	—	—	Acid Steam or wet	
16	4	—	—	Steam or wet	Suitable for silk
17					
18					
19	4	—	—	Steam or wet	
20	4-5	—	—	" "	
21	5	—	—	" "	
22	5	—	4-5	Hot water after dyeing and diazo- tising	Suitable for nylon
23	5	—	4-5	" " " "	Suitable for nylon
24	5	—	4-5	" " " "	Suitable for nylon
25	3	—	—	Acid steam or wet	
26	3	—	—	" " "	
27	3	—	—	Neutral steam	
28	4-5	4	—	Dye and diazotise	Tungsten light—much redder
29	—	5	4	Steam or wet	
30	5	5	—	Dye with carrier, diazotise	
31	5	5	—	" " "	
32	3	5	—	Steam	Suitable for resin finishes, no hue or light fastness change
33	4	—	—	Steam or wet	
34	5	4-5	—	Dye and diazotise	
35	5	4-5	—	" "	
36	2-3	—	—	Steam or wet	

# C.I. Azoic Green 1—(4)

C.I. Azoic Green	C.I. Coupling Component	C.I. Diazo Component	Hue  (Fibre)	Fastness				
				Light ( $\frac{1}{8}$ N)		Light (2N)		Washing
				AATCC	ISO	AATCC	ISO	
1	37585	37175	Dull Bluish Green (Cotton)	1-2	3	3	5	5
2	—	—	Bright Yellowish Green "	—	6-7	—	7	4-5
3	—	—	" " " "	—	6-7	—	7	4-5
3:1	Similar in hue, application and properties to C.I. Azoic Green 3, but slightly different chemically							
4	—	—	Green (Cotton)	—	5	—	6-7	4-5

C.I. Azoic Green	Fastness			Development	Notes
	Chlorine	Hot Pressing	Rubbing		
1	3	5*	—	Wet or Steam	*AATCC tests Wet development for pale dyeings only
2	—	5	3-4	Wet or acid steam	
3	—	5	3-4	Wet or steam	
3:1					
4	4	—	—	Steam	

# C.I. Azoic Brown 1—(32)

C.I. Azoic Brown	C.I. Coupling Component	C.I. Diazo Component	Hue  (Fibre)	Fastness				
				Light ( $\frac{1}{3}$ N)		Light (2N)		Washing
				AATCC	ISO	AATCC	ISO	
1	—	—	Dull Brown (Cotton)	—	—	2	—	4*
2	37545	37010	Reddish Brown "	5	—	7-8	—	4*
3	37600	37010	Yellowish Brown "	—	—	—	6	4-5
4	—	—	Reddish Brown "	—	—	—	7	5
5	37600	37120	Brown "	—	—	—	6-7	4-5
6	This C.I. Generic Name is discontinued. The products formerly listed under it are now listed under C.I. Azoic Brown 2							
7	37600	37120	Brown (Cotton)	4	5	6	7	4
8	—	—	" "	4-5	—	6	—	4*
9	—	—	Reddish Brown "	3-4	—	5	—	4*
10	37550+ 37605	37120	Dull Brown "	4	—	6	—	4*
11	37600	37107	Brown "	—	5-6	—	6-7	4-5
12	—	—	Dull Reddish Brown "	—	2-3	—	4	4
13	—	—	Reddish Brown "	—	3-4	—	5-6	4
14	37600	37005	Brownish Olive "	—	6	—	7	4
15	37600	37100	Reddish Brown "	—	6	—	7	4
16	37605	37120	Dull Reddish Brown "	—	5-6	—	6	4
17	37605	37150	Dull Brown "	—	5-6	—	6-7	4
18	This C.I. Generic Name is discontinued. The products formerly listed under it are now listed under C.I. Azoic Brown 14							
19	—	—	Dull Brown (Cotton)	—	5	—	7	4-5
20	—	—	(Acetate)	—	6	—	7	5
21	—	—	" "	—	6-7	—	7	5
22	—	—	" "	—	6-7	—	7	5
23	—	—	" "	—	6-7	—	7	5
24	—	—	Brown (Cotton)	—	—	—	7	5
25	—	—	" "	—	—	—	—	—
26	—	—	" "	—	—	4-5	—	4-5*
27	—	—	Yellowish Brown "	—	—	5-6	—	4-5*
28	37600	37112	" "	—	6	—	7	4
29	37600	37077	" "	—	6-7	—	7	4-5
30	37600	37090	Brown "	—	6	—	6-7	5
32	108	37090+ 37600	" "	—	6	—	6-7	5



C.I. Azoic Brown	Fastness			Development	Notes
	Chlorine	Hot Pressing	Rubbing		
1	1*	—	—	Acid steam	*AATCC tests
2	3-4*	5*	—	Acid steam or wet	*AATCC tests. See also C.I. Pigment Brown 1, C.I. 12480
3	4	—	—	" " "	Suitable for silk
4	4	—	—	" " "	Suitable for silk
5	5	—	—	" " "	Suitable for silk. See also C.I. Azoic Brown 7
6					
7	4	1*	—	Steam or wet	*AATCC tests
8	3-4*	1*	—	Acid steam or wet	*AATCC tests
9	4*	5*	—	" " "	*AATCC tests
10	4*	5*	—	" " "	*AATCC tests
11	4	—	—	Steam or wet	
12	5	—	—	Steam	
13	3-4	—	—	Steam	
14	4	—	—	Acid steam or wet	Suitable for silk
15	4	—	—	Steam or wet	
16	4	—	—	Acid steam	
17	4	—	—	" "	
18					
19	4-5	—	—	Steam or wet	
20	4	—	4	Hot water, after dyeing and diazo- tising	Suitable for nylon
21	5	—	4	" " " "	Suitable for nylon
22	5	—	4-5	" " " "	Suitable for nylon
23	5	—	4	" " " "	Suitable for nylon
24	4-5	5	—	Steam or wet	
25	—	—	—	Acid steam	
26	1*	5*	—	" "	*AATCC tests
27	3-4*	—	—	" "	*AATCC tests
28	3-4	—	—	Steam	
29	4-5	—	—	"	
30	3-4	—	—	Steam or wet	
32	3-4	4	—	" "	

# C.I. Azoic Black 1—(30)

C.I. Azoic Black	C.I. Coupling Component	C.I. Diazo Component	Hue (Fibre)	Fastness				
				Light (1N)		Light (2N)		Washing
				AATCC	ISO	AATCC	ISO	
1	—	—	Reddish Black (Cotton)	2	—	4	—	4*
2	—	—	Greenish Black "	—	—	5	—	4*
3	*37590	37125	Black "	—	—	—	6-7	5
4	—	—	Bluish Black "	—	—	—	5	4
5	37530+ 37610	37255	Black "	—	2-3	—	4	5
5:1	Similar in hue, application and properties to C.I. Azoic Black 5, but slightly different chemically							
6	—	—	Black (Cotton)	—	—	—	5-6	5
7	—	—	" "	—	—	—	7	—
8	—	—	Greenish Black (Polyester)	—	—	—	6-7	5
9	—	—	Black (Acetate, Nylon)	—	—	—	6	5
10	—	—	" (Cotton)	—	—	—	2-3	4*
11	—	—		—	—	—	—	—
12	—	—	Black (Cotton)	—	—	—	7	5
13	—	—	" "	—	—	—	5-6	—
14	—	—	" "	—	—	—	7	5
15	—	—	" "	—	—	4-5	—	4*
16	—	—	Black (Polyester)	—	—	—	7	5
17	—	—	" (Cotton)	—	—	—	4-5	5
18	—	—	" "	—	—	—	4-5	5
19	—	—	" "	—	—	—	3	4-5
20	—	—	" (Polyester)	—	—	—	5-6	5
21	—	—	" "	—	—	—	5-6	5
22	—	—	" "	—	—	—	6-7	5
23	C.I. De- veloper 8	C.I. Dis- perse Black 9	" (Triacetate)	2	—	4	—	4*
24	—	—	Reddish Black (Cotton)	—	3-4	—	—	—
25	—	—	Greenish Black (Polyester)	—	—	—	6	5
26	—	—	Reddish Black (Cotton)	—	—	—	4	4-5
27	—	—	Black "	—	—	—	4	4-5
28	—	—	" "	—	—	—	4-5	4-5
30	—	—	" (Polyester)	—	—	—	6	5

C.I. Azoic Black	Fastness			Development	Notes
	Chlorine	Hot Pressing	Rubbing		
1	4*	5*	—	Acid steam or wet	*AATCC tests *AATCC tests *plus $\beta$ -tetralolcarboxy-2-naphthylamide
2	2*	—	—	Acid steam	
3	4	—	—	Steam or wet	
4	4-5	—	—	Steam	
5	2-3	—	—	Neutral steam	
5:1					
6	5	—	—	Steam	Fastness on nylon: Chlorine 4; Light 5; Perspiration 5; Washing 5 *Soda boil
7	4	—	—	Steam or wet	
8	—	4-5	—	Dye and diazotise	
9	5	5	—	” ”	
10	4	4	—		
11	—	—	—	Acid steam	*AATCC tests
12	5	5	—	Steam or wet	
13	3	—	4-5	Acid steam	
14	3-4	4	4-5	Steam	
15	2*	4*	—	Acid steam	
16	5	4-5	—	Dye, diazotise at 80°	Phthalocyanine derivative
17	3	—	4	Neutral steam	
18	2	5	—	Acid steam	
19	1	4	—	” ”	
20	5	5	—	Dye, diazotise at 80°	
21	5	5	—	” ” ”	*AATCC tests. Suitable for acetate, nylon
22	5	5	—	Dye and diazotise	
23	2*	5*	4*		
24	2-3	4-5	—	Steam or wet	
25	5	5	—	Dye and diazotise	
26	2-3	—	—	Steam or wet	Good fastness to nitrous fumes Monoethyl ethyleneglycol needed in paste
27	3-4	5	3	” ”	
28	3-4	—	—	Steam	
30	5	5	—	Dye and diazotise at 85°	





# BASIC DYES

This section of the Colour Index deals with those dyes which in aqueous solution yield coloured cations.

Only one basic dye, Berberine, C.I. Natural Yellow 18, is known to occur in nature, but many of the earliest synthetic dyes, including Perkin's Mauve, the first dye to be produced commercially from coal tar, were basic dyes. Perkin himself was largely responsible for devising the standard methods of application of these dyes to the fibres then available, namely silk, wool and cellulosic fibres (mainly cotton). The appeal of these basic dyes lay in their brilliant hues, some of them being fluorescent. Unfortunately their brilliance was not matched by their fastness. Because of their poor fastness properties, particularly to light, basic dyes were largely superseded following the development of other classes of dyes having superior fastness properties. Basic dyes were retained to a small extent for dyeings where brightness was all important. By the time of publication of the second edition of the *Colour Index* in 1956, their traditional textile usage was very small indeed.

In the late 1930's a few basic dyes were developed for application to acetate and to a lesser extent for nylon. Once again, however, although giving bright dyeings, their light fastness tended to be relatively poor. A number of these dyes were later to become more important for application to acrylic fibres.

The advent in 1950 of acrylic fibres gave the basic dyes a new lease of life. Although the original fibres of 100% polyacrylonitrile had poor dyeing properties, it was found that co-polymerisation with 5–10% of other monomers resulted in fibres of a more open structure and could also be used to introduce anionic sites, thus conferring ready dyeability with basic dyes. Many existing basic dyes were found to be much faster to light on these fibres than on natural fibres. This led to the introduction of complete ranges specifically designed for application to acrylic fibres. This is well illustrated by the growth of this Section. The total number of Generic Names issued in each hue are as follows, the number in the Second Edition (1956) being given in parentheses:—Yellow 54 (13), Orange 48 (23), Red 70 (14), Violet 40 (14), Blue 96 (26), Green 10 (5), Brown 15 (8), Black 8 (5). Almost 70% of the C.I. Generic names listed in this Section relate to dyes for acrylic fibres.

The modacrylic fibres resulted from the continued development of the earlier acrylic fibres. They are copolymers of acrylonitrile with other monomers, e.g. vinylidene chloride, or such strongly basifying substances as vinyl pyridine. Although there is no fixed dividing line, the U.S. Federal Trade Commission defines "modacrylic" fibres as those containing 35–85% polyacrylonitrile, those above 85% polyacrylonitrile being designated as "acrylic" fibres.

Recent developments have been the introduction of anionic dye-sites into nylon and polyester fibres, and a few basic dyes have been developed specifically for dyeing one or more of these modified fibres. At the time of writing, these fibres are still to some extent in the development stage and such information as has been included may become obsolete with changes in fibre constitution.

## Non-textile usage

Whilst the major textile usage of basic dyes is on acrylic fibres, large weights of some of the older basic dyes are still produced for a wide variety of non-textile usage, some of which are summarised below.

### *Coloration of paper*

The paper industry uses large weights of the older basic dyes mainly for dyeing papers made from unbleached and mechanical pulps and when light fastness is of little consequence. High lignin-content pulps have high substantivity for basic dyes, although this is reduced on bleaching. The solubility of basic dyes is not great, and solution problems are minimised by many dyes being available in liquid form.

### *Pigments*

These are produced by co-precipitation with inorganic acids of high molecular weight, for example phosphomolybdotungstic acid. The more important examples are covered in the Pigments Section.

### *Solvent Dyes*

The free bases are used as solvent dyes, the more important examples being covered in the Solvent Dyes Section.

### *Dyeing of Leather*

This is a traditional usage of basic dyes, but as on the natural fibres, their dyeings have poor light fastness. Current usage is small and almost confined to "topping" of dyeings based on other faster dyes to give fuller and bloomier hues.

## Textile usage

### *General*

Basic dyes are water-soluble, but in most cases solution is facilitated by pasting the dye with acetic acid and water. Most dyebaths require addition of acetic acid and it is often convenient to use part of this requirement for the above pasting process. Since solubility is not generally of a high order, the availability of some dyes in liquid form is an additional aid to dyebath preparation.

### *Cotton*

Basic dyes were formerly applied largely on a tannin mordant. This has been almost completely displaced by other classes of dye which give dyeings of much superior fastness. Other application methods included printing on a tannin mordant or dyeing on a discharged tannin mordant.

### *Bast Fibres*

Despite their poor fastness properties use of basic dyes continued on bast fibres as an economical means of coloration for many years after their usage on cotton became negligible.

### *Silk and Wool*

Although now of little interest, basic dyes were originally used for bright colours, particularly on silk. They were applied by dyeing or printing under acid conditions.

### *Acrylic Fibres*

This is the current major textile usage of basic dyes. Selection of dyes for use in mixtures is important. Not only should they have similar dyeing rates but should not cause

“blocking” effects, i.e. preferential uptake of one dye, which, by occupying dye sites in the fibre prevents full build-up of the other dyes in the mixture.

Basic dyes may be applied by printing from pastes containing acetic acid, subsequent fixation being by steaming. Some dyes are suitable for discharge printing and some for illuminating discharges.

#### Modacrylic Fibres

The problems of dye selection are greater than with the acrylic fibres because apart from a tendency towards lower light fastness, incompatibility of dyes, particularly with regard to “blocking” effects, is generally more noticeable.

*Modified Nylon and Modified Polyester Fibres*  
As with the modacrylic fibres, dye selection is important.

#### Acetate

Selected dyes give bright colours on this fibre, application being by dyeing or more practically by printing from a paste containing acetic acid.

#### Poly(vinylchloride) Fibres

Selected dyes are applicable as complexes with anionic surfactants.

#### Dyeing Methods

The following table gives general guidance to typical methods of application.

SUMMARY OF TYPICAL DYEING METHODS FOR BASIC DYES

Fibre	Dyebath Additions	Method																		
Tannin-Mordanted Cotton	5% acetic acid or alum	Enter cold, add the dye in portions during 60 min. Then raise to 60°C for a further 30 min.																		
Bast Fibres (mordant not required)	As for cotton	Enter at 30–40°C for 30 min. and then raise to 70–80°C during 30 min.																		
Silk	2–5% acetic acid	Enter cold, adding dye in portions if necessary. After 15 min. raise to 90°C during 60 min.																		
Wool	Dye neutral or with acetic acid	Similar to that for silk; large additions of acid retard the uptake of dye.																		
Acrylic	pH 4.0–5.5. Typical additions are as follows: <table><tr><td></td><td colspan="2">Depth of dyeing</td></tr><tr><td></td><td>pale</td><td>heavy</td></tr><tr><td>acetic acid</td><td>2.0%</td><td>0.5%</td></tr><tr><td>sodium acetate</td><td>0.5%</td><td>2.0%</td></tr><tr><td>sodium sulphate</td><td colspan="2">Up to 10%</td></tr><tr><td colspan="3">Cationic or anionic retarders may be added to promote level dyeing</td></tr></table>		Depth of dyeing			pale	heavy	acetic acid	2.0%	0.5%	sodium acetate	0.5%	2.0%	sodium sulphate	Up to 10%		Cationic or anionic retarders may be added to promote level dyeing			Commence at 50–60°C and raise to 100°C in 60–90 min. Dyeing rate increases very rapidly at 80–100°C and careful temperature control, with slow rate of rise, is essential to obtain level dyeings. Another method adds the dye after the liquor reaches 90–100°C. Exhaust at boil. Finally, the bath should be cooled slowly (less than 1 degree C per min.) to below 70°C before removing the material.
	Depth of dyeing																			
	pale	heavy																		
acetic acid	2.0%	0.5%																		
sodium acetate	0.5%	2.0%																		
sodium sulphate	Up to 10%																			
Cationic or anionic retarders may be added to promote level dyeing																				
Modacrylic	Much as for acrylic fibres – addition of carrier may be necessary in some cases	Much as for acrylic fibres.																		
Modified Polyesters (basic dyeable copolymers)	Adjust to pH 5 with acetic acid. Addition of carrier such as used in application of disperse dyes is often advisable	Commence at 50°C, raise to boil for 60 min.																		
Modified Nylon (basic dyeable copolymers)	2% acetic acid	Commence at 40°C, raise to boil over 30 min. and maintain at boil for 45–60 min.																		
Acetate	2% acetic acid 2% resorcinol	Dye for 60 min. at 80°C.																		
PVC Fibres	Dye is complexed with an anionic surfactant	Commence at 60°C, raise to boil for 60–90 min. Cool slowly as for acrylic fibres.																		

The above methods are intended only as a guide to dyeing conditions. Many variations can be found in practice. All percentages are on weight of fibre.

#### Fastness Tests

In general the data quoted is based on ISO and AATCC test methods, but some of the older information repeated from

the Second Edition relates to tests which are now obsolete. This is marked \* and details of the tests may be found in the Second Edition, Volume 4.

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# C.I. Basic Yellow 1—5

C.I. Basic Yellow	1	2	3	4	5
<b>CHEMICAL CLASS</b>	Thiazole	Ketone Imine	Ketone Imine	Acridine	Acridine
<b>C.I. CONSTITUTION NO.</b>	49005	41000	41005	—	†See notes
<b>SUBSTRATE</b>	SILK	SILK	SILK	SILK	COTTON (tannin-mordanted)
<b>HUE</b>	Bright Greenish Yellow	Bright Yellow	Greenish Yellow	Bright Reddish Yellow	Yellow
Artificial Light (tungsten)	redder	redder	redder	redder	redder, weaker
<b>RESERVATION IN DYE BATH</b>					
cotton	—	2	—	—	—
viscose	—	2	—	—	—
wool	—	2	—	—	—
nylon (type)	—	4	—	—	—
polyester	—	—	—	—	—
<b>FASTNESS</b>					
<b>TEST METHODS</b>	<b>C*</b>	<b>B*</b>	<b>C*</b>	<b>C*</b>	<b>A*</b>
<b>Light</b>	source	daylight	daylight	daylight	daylight
pale	—	1	1	—	—
medium	3	1	2	1	1-2
heavy	—	2	2	—	—
<b>Perspiration</b>	acid/alk.	alk.	alk.	alk.	alk.
change	2-3	2	1	1	1-2
staining	—	1	—	2	—
<b>Pleating (steam)</b>	conditions	—	—	—	—
change	—	—	—	—	—
staining	—	—	—	—	—
<b>Pressing (dry)</b>	conditions	—	—	—	—
change	4	3-4	—	—	2-3
after 2-4 hr	—	4	—	—	—
staining	—	—	—	—	—
<b>Washing</b>	conditions	SDC 1	—	—	—
change	1	1	2	2	1-2
staining	—	3	—	—	—
<b>NOTES ON APPLICATION AND USAGE</b>	<p><b>Tannin-mordanted Cotton</b> fastness (B*) daylight, 2 washing, 1, 4 Suitable illuminating discharge printing</p> <p><b>Wool</b> fastness (C*) daylight, 2</p> <p><b>Bast fibres</b></p> <p><b>Acetate, Nylon</b> fluorescent hues</p> <p><b>Ball Point Inks</b></p> <p><b>Pigments:</b> C.I. Pigment Yellow 18</p>	<p><b>Tannin-mordanted Cotton</b>—for dyeing and direct and illuminated discharge prints Fastness (B*) light, 2-3 washing (1), 2, 4 perspiration, 1-2</p> <p><b>Wool</b> fastness (C*) light, 1, 1-2, 2 washing, 1-2, 2</p> <p><b>Bast fibres</b></p> <p><b>Paper</b></p> <p><b>Leather</b></p> <p><b>Spirit Inks, etc.</b></p> <p><b>Biological Stain</b></p> <p><b>Free base is C.I. Solvent Yellow 34</b></p>	<p><b>Tannin-mordanted Cotton</b>—for dyeing and illuminated discharge prints Printing also by direct and discharged tannin mordant Fastness (C*) light, 1, 2, 3 washing, 2</p> <p><b>Wool</b> fastness (C*) light, 1, 1, 1 washing, 1, 1-2</p> <p><b>Pigments</b></p> <p><b>Spirit Inks</b></p> <p><b>Leather</b></p>	<p><b>Tannin-mordanted Cotton</b>—as illuminating colour in discharge printing Fastness (C*) light, 1, 1, 2 washing, 2</p> <p><b>Wool</b> fastness (C*) light, 1, 1, 1 washing, 1, 1-2</p> <p><b>Pigments</b></p> <p><b>Leather</b></p>	<p>Suitable as illuminating colour in discharge printing</p> <p><b>Leather</b> Veg. tannages</p> <p><b>Paper</b></p> <p>†Very similar in constitution to C.I. 46045</p>

# C.I. Basic Yellow 1-13

C.I. Basic Yellow	6	7	8	9	10
CHEMICAL CLASS	Acridine	Acridine	Acridine	Acridine	—
C.I. CONSTITUTION NO.	46020	46020	—	46040	—
SUBSTRATE	SILK	COTTON (tannin-mordanted)	COTTON (tannin-mordanted)	SILK	SILK
HUE	Yellow	Dull Reddish Yellow	Reddish Yellow	Greenish Yellow	Reddish Yellow
Artificial Light (tungsten)	redder	—	—	redder	redder
RESERVATION IN OVERBATH cotton viscose wool nylon (type) polyester					
FASTNESS Test Methods	C*	C*	C*	C*	A*
Light source	daylight	daylight	daylight	daylight	daylight
pale	1	—	—	1	—
medium	2	2	2	2	1-2
severe	—	—	—	2	—
Perspiration red/alk.	—	alk.	alk.	—	alk.
change	—	2	2-3	—	2-3
staining	—	—	—	—	—
Pressing conditions	—	—	—	—	—
(steam) change	—	2	—	—	—
staining	—	—	—	—	—
Pressing conditions	—	—	—	—	—
(dry) change	—	3-4	3-4	—	2
after 2-4 hr	—	—	—	—	—
staining	—	—	—	—	—
Washing conditions	—	—	—	—	—
change	2	2	2	1-2	1-2
staining	—	—	—	—	—
NOTES ON APPLICATION AND USAGE	Tannin-mordanted Cotton—direct dyeing and printing and as illuminating colour in discharge printing Fastness (C*) light, 1, 1, 2 washing, 3-2  Wool fastness (C*) light, 1 washing, 1, 1-2  Pigments Leather	Leather	Leather	On tannin-antimony mordant gives fluorescent shades  Mordanted Cotton—as illuminating colour in discharge printing Fastness (C*) light, 1, 1, 2  Wool fastness (C*) light, 1, 2, 2  Bast fibres Leather Pigments Spirit Inks, etc. Wood Stains	Suitable for printing  Tannin-mordanted Cotton—hue, bright yellow Fastness (A*) light, 1 washing, 1-2 perspiration, 1-2 hot pressing, 3 Suitable for printing  Wool Paper Leather

11	12	13	14	15	C.I. Basic Yellow
Methine	Methine	Cyanine	Methine	Monoazo	<b>CHEMICAL CLASS</b>
48055	48065	—	—	—	<b>C.I. CONSTITUTION NO.</b>
ACRYLIC	ACRYLIC	ACRYLIC	ACRYLIC	ACRYLIC	<b>SUBSTRATE</b>
Bright Yellow	Bright Greenish Yellow	Bright Greenish Yellow	Bright Yellow	Bright Reddish Yellow	<b>HUE</b>
redder	redder, weaker	redder	redder	redder	Artificial Light (tungsten)
4-5 4 4 4-5 (6-6) 5	4-5 4-5 4 4-5 (6) 5	4-5 4-5 4-5 4-5 5	— 5 5 — —	— — 5 — —	<b>RESERVATION IN DYEBATH</b> cotton viscose wool nylon (type) polyester
ISO    AATCC	ISO (Courtele) Xe. arc	ISO    AATCC	AATCC	AATCC (Orlon 42) C. arc	<b>FASTNESS</b> <b>TEST METHODS</b>
day. 4-5 6 6-7	day. 5-6 7 7	day. 5 6-7 7	C. arc 4-5 6 7	C. arc 4-5 7-8 8 —	Light    source pale medium heavy
alk. 5 4-5	alk. 5 5	alk. 5 5	alk. 5 5	alk. 4-5 5	Perspiration    acid/alk. change staining
inter. 4-5 4-5	inter. 4-5 —	inter. 4-5 —	intermediate 5 —	intermediate 4-5 4-5	Pleating (steam)    conditions change staining
— 4 4 —	II 4 4-5 —	140°C    II 4-5    4 5    5 5    5	II 4 5 —	II 4-5 — —	Pressing (dry)    conditions change after 2-4 hr staining
3 4-5 4-5	III 5 —	3    III 4-5    5 5    5	III 5 5	III 5 5	Washing    conditions change staining
Dyeing: rate-moderate levelling-good Suitable for discharge printing  Acetate—by dyeing and printing Fastness (AATCC) light (C. arc), 4 washing II, 4-5, 5 persp. (alk.), 5, 3  PVC fibres—dye as complex with anionic surfactant Fastness (AATCC) light (C. arc), 4, 5 washing II, 5, 5 persp. (alk.), 4-5	Acetate—by printing Fastness (ISO) light, 3, 4-5, 5 washing, 5 sublimation, 5	Moderate dyeing rate. Stable from pH 2-6, good build up As illuminating colour in discharge printing (stannous salts)  Acetate—prints Fastness (ISO) daylight, 5, 6, 6-7 washing (I), 4, 4-5 persp. (alk.), 4-5, 4  PVC fibres—dye as complex with anionic surfactant Fastness (AATCC) light (C. arc), 5 persp. (alk.), 5, 4-5 washing II, 5, 5  Modacrylics Suitable	Stable pH 2-4.5 Redder, but otherwise similar C.I. Basic Yellow 11 Suitable for illuminated discharge prints (stannous salts)  Acetate—print Fastness (AATCC) light (C. arc), 4-5 washing II, 4-5, 5 persp. (alk.), 5, 3  PVC fibres—dye as complex with anionic surfactant Fastness (AATCC) light (C. arc), 4, 5 washing II, 5, 5	Stable pH 4.5-8 Gives redder hue below pH 4.5 Dyeing rate—slow build up—good Readily stripped with hypochlorite	<b>NOTES ON APPLICATION AND USAGE</b>

**C.I. Basic Yellow 16—25**

<b>C.I. Basic Yellow</b>	<b>16</b>	<b>17</b>	<b>18</b>	<b>19</b>	<b>20</b>
<b>CHEMICAL CLASS</b>	Nitro	—	—	Monoazo	
<b>C.I. CONSTITUTION NO.</b>	—	—	—	—	
<b>SUBSTRATE</b>	ACRYLIC	ACRYLIC	ACRYLIC	ACRYLIC	
<b>HUE</b>	Bright Yellow	Bright Yellow	Bright Yellow	Reddish Yellow	
Artificial Light (tungsten)	redder	slightly redder	redder	slightly redder	
<b>RESERVATION IN DYE BATH</b>					
cotton	—	5	5	5	
viscose	—	5	5	5	
wool	—	4-5	4-5	5	
nylon (type)	—	3	4-5	3-4	
polyester	—	4-5	5	4-5	
<b>FASTNESS</b>					
<b>TEST METHODS</b>	<b>AATCC</b>	<b>ISO</b> (Orlon 42)	<b>ISO</b>	<b>ISO</b> (Orlon 42)	
Light source	C. arc	daylight	daylight	daylight	
pale	4-5	5	4-5	6-7	
medium	—	6	6	7	
heavy	—	6-7	6-7	7-8	
Perspiration acid/alk. change staining	alk. 5 —	alk. 5 5	alk. 5 5	alk. 5 5	This C.I. Generic Name is discontinued. Dyes formerly listed under it now appear under C.I. Basic Yellow 13
Pleating (steam) conditions change staining	— — —	intermediate 5 3-4	intermediate 5 4-5	intermediate 5 4-5	
Pressing (dry) conditions change after 2-4 hr staining	— — — —	30 sec/160°C 4-5 — 4-5	— — — —	— — — —	
Washing conditions change staining	III A 4-5 —	ISO 3 5 5	ISO 3 5 4-5	ISO 3 5 5	
<b>NOTES ON APPLICATION AND USAGE</b>		Stable below pH 5 Not recommended for high temp. dyeing Light fastness given by carbon arc fading lamps is much lower than daylight fastness  <b>Modacrylic fibres</b> Suitable	Stable below pH 7 Rapid dyeing, stable up to 130°C  <b>Modacrylic</b> Fastness (ISO) daylight, 4-5, 5 persp., 4-5, 4-5 wash (3), 5, 4-5  <b>Polyester</b> (basic dyeable) (Dacron 62) Fastness (ISO) daylight, 4, 4-5 persp., 5, 5 wash (3), 4-5, 5 steam pleating (inter.), 5, 5	Stable up to pH 5.5 and 130°C Rapid dyeing, good levelling Suitable for printing  <b>Modacrylics</b> (Verel) Fastness (ISO) daylight, 6, 6-7 persp., 4-5, 4-5 wash (3), 4-5, 4-5  <b>Polyester</b> (basic dyeable) (Dacron 62) Fastness (ISO) daylight, 4-5, 6 persp., 5, 5 wash (3), 5, 5 steam pleating (inter.), 5, 4-5	



21	22	23	24	25	C.I. Basic Yellow
Polymethine	Methine	Methine	Azo-methine	Azo	CHEMICAL CLASS
—	—	—	—	—	C.I. CONSTITUTION NO.
ACRYLIC	ACRYLIC	ACRYLIC	ACRYLIC	ACRYLIC	SUBSTRATE
Bright Greenish Yellow	Reddish Yellow	Bright Greenish Yellow	Bright Greenish Yellow	Reddish Yellow	HUE
—	little change	redder	redder	slightly redder	Artificial Light (tungsten)
4 3-4 2 4 (6.6) 4	5 — 4 — —	— — — — —	— — — — —	— — — — —	RESERVATION IN DYEBATH cotton viscose wool nylon (type) polyester
ISO daylight 6-7 7 7  alk. 5 5  intermediate 5 4-5  — — — —  ISO 3 5 5	ISO daylight 4-5 5 —  alk. 5 5  — — —  15 sec/150°C 4 5 —  ISO 2 5 5	ISO daylight 6-7 7 7-8  alk. 5 5  — — —  10 sec/200°C 4-5 5 5  ISO 3 4 5	ISO daylight 6-7 6-7 7  alk. 4-5 5  — — —  10 sec/200°C 4-5 5 5  ISO 3 4 4-5	ISO AATCC daylight C.arc 6 7 6-7 7-8 7 —  alk. alk. 5 3-4 5 —  — — — — — —  10"/200°C — 4-5 — 5 — 4-5 —  ISO 3 III 4 3-4 4 —	FASTNESS TEST METHODS  Light source pale medium heavy  Perspiration acid/alk. change staining  Pleating conditions (steam) change staining  Pressing conditions (dry) change after 2-4 hr staining  Washing conditions change staining
Applicable by dyeing and printing  Acetate (print) Fastness (ISO) daylight, 7 wash (2), 3, 2-3 persp., 5, 3  Silk (print) Fastness (ISO) daylight, 4, 5, 6 persp., 3, 2 wash (1), 3, 2-3	Not discharge-able Light fastness in carbon arc fading lamps is substantially lower than daylight figures			Polyester (basic dyeable) Suitable  Acetate Suitable for dyeing and printing	NOTES ON APPLICATION AND USAGE

**C.I. Basic Yellow 26—35**

<b>C.I. Basic Yellow</b>	<b>26</b>	<b>27</b>	<b>28</b>	<b>29</b>	<b>30</b>
<b>CHEMICAL CLASS</b>	Monoazo	Monoazo	Methine	Methine	Monoazo
<b>C.I. CONSTITUTION NO.</b>	—	—	—	—	—
<b>SUBSTRATE</b>	ACRYLIC	ACRYLIC	ACRYLIC	ACRYLIC	ACRYLIC
<b>HUE</b>	Bright Yellowish Green	Bright Yellow	Reddish Yellow	Yellow	Bright Reddish Yellow
Artificial Light (tungsten)	slightly bluer	slightly redder	redder	redder	redder
<b>RESERVATION IN DYE BATH</b>					
cotton	5	4	5	5	—
viscose	5	5	5	5	—
wool	3-4	3-4	5	5	—
nylon (type)	3-4	5	5	5	—
polyester	5	—	5	5	—
<b>FASTNESS</b>					
<b>TEST METHODS</b>	<b>AATCC</b>	<b>AATCC</b>	<b>ISO</b>	<b>ISO</b>	<b>AATCC</b>
Light			daylight	daylight	daylight
source	—	—	6	6-7	6-7
pale	6	6	6-7	7	6-7
medium	6	6-7	7	7-8	—
heavy	—	—	—	—	—
Perspiration	acid/alk.	alk.	alk.	alk.	alk.
change	5	4-5	5	5	4
staining	—	—	5	5	—
Pleating (steam)	conditions	—	intermediate	intermediate	severe
change	—	—	5	5	3-4
staining	—	—	4	5	—
Pressing (dry)	conditions	—	—	—	—
change	—	—	—	—	—
after 2-4 hr	—	—	—	—	—
staining	—	—	—	—	—
Washing	conditions	III A	ISO 3	ISO 3	III A
change	4-5	4-5	5	5	4-5
staining	5	5	5	5	—
<b>NOTES ON APPLICATION AND USAGE</b>	Not dischargeable Suitable for printing Apply from weakly acid dyebath	Not dischargeable Suitable for printing Apply from weakly acid dyebath	Not dischargeable <b>Acetate, Tri-acetate, Silk</b> by direct printing processes	Not dischargeable <b>Acetate, Tri-acetate, Silk</b> by direct printing processes	Rapid dyeing from weakly acid bath Good stability over a wide pH range Not suitable for printing  <b>Polyester</b> (basic dyeable) Suitable

31	32	33	34	35	C.I. Basic Yellow
Quinoline	Monoazo	Methine	Azo	Methine	CHEMICAL CLASS
—	—	—	—	—	C.I. CONSTITUTION NO.
ACRYLIC	ACRYLIC	ACRYLIC	ACRYLIC	ACRYLIC	SUBSTRATE
Bright Yellow	Reddish Yellow	Bright Greenish Yellow	Yellow	Bright Reddish Yellow	HUE
—	slightly redder	redder	redder	redder	Artificial Light (tungsten)
3-4 4 3 1-2 3-4	3 3 2-3 2-3 (6-6) 4	— — — — —	— — — — —	— — — — —	RESERVATION IN DYEBATH cotton viscose wool nylon (type) polyester
AATCC daylight 7-8 8 8  alk. 4 5  intermediate 5 5  1 min/160°C 4-5 — —  III 4-5 4-5	ISO (Orlon 42) daylight 6-7 7 7  alk. 4-5 5  — — —  30 sec/180°C 4-5 — 5  ISO 3 4-5 5	AATCC (Vonnell) Carbon arc 4 5-6 5-6  alk. 5 5  severe 5 5  15 sec/180°C 5 — —  III 5 5	AATCC (Vonnell) Carbon arc 5 5-6 5-6  alk. 5 5  severe 5 5  15 sec/180°C 5 — —  III 5 —	AATCC (Vonnell) Carbon arc 3-4 4 4-5  alk. 5 5  severe 5 5  15 sec/180°C 5 — —  III 5 —	FASTNESS TEST METHODS  Light source pale medium heavy  Perspiration acid/alk. change staining  Pleating conditions (steam) change staining  Pressing conditions (dry) change after 2-4 hr staining  Washing conditions change staining
Stable over range pH 2-8 Stable at 120°C Slow dyeing Not suitable for printing Gives dull yellow stain of good light fastness on wool  <b>Polyester</b> (basic dyeable) (Dacron 64) Fastness (AATCC) daylight, 5-6, 7-8  <b>Modacrylics</b> Suitable		Not dischargeable Suitable for deep shades having high fastness to steam pleating	Dischargeable to white	Not dischargeable	NOTES ON APPLICATION AND USAGE

**C.I. Basic Yellow 36—45**

<b>C.I. Basic Yellow</b>	<b>36</b>	<b>37</b>	<b>38</b>	<b>39</b>	<b>40</b>
<b>CHEMICAL CLASS</b>	Azo	Ketone Imine	Monoazo	Monoazo	Methine
<b>C.I. CONSTITUTION NO.</b>	—	41001	—	—	—
<b>SUBSTRATE</b>	ACRYLIC	ACRYLIC	ACRYLIC	ACRYLIC	ACRYLIC
<b>HUE</b>	Yellow	Bright Greenish Yellow	Reddish Yellow	Bright Reddish Yellow	Greenish Yellow (fluorescent)
Artificial Light (tungsten)	—	redder	slightly redder	slightly redder	redder, duller
<b>RESERVATION IN DYEBATH</b>					
cotton	—		5	4	4
viscose	5		4	3-4	4
wool	4-5		4	3	4
nylon (type)	4		5	4	4
polyester	5		5	5	4
<b>FASTNESS</b>					
<b>TEST METHODS</b>	<b>AATCC</b>		<b>ISO</b>	<b>ISO</b>	<b>ISO</b>
<b>Light</b>	<b>Carbon arc</b>		<b>daylight</b>	<b>daylight</b>	<b>daylight</b>
source	5-6		5	6	3
pale	7		5-6	6-7	3-4
medium	7		6	7	4
heavy					
<b>Perspiration</b>	<b>alk.</b>		<b>alk.</b>	<b>alk.</b>	<b>alk.</b>
acid/alk.	5		5	5	5
change	5	Very similar in structure, usage and properties to C.I. Basic Yellow 2	5	5	5
staining					
<b>Pleating (steam)</b>	<b>intermediate</b>		<b>intermediate</b>	<b>intermediate</b>	<b>intermediate</b>
conditions	4-5		4-5	4-5	5
change	—		—	—	5
staining					
<b>Pressing (dry)</b>	<b>15 sec/160°C</b>		<b>30 sec/180°C</b>	<b>30 sec/180°C</b>	
conditions	4		4-5	4-5	—
change	5		—	—	—
after 2-4 hr	—		4-5	4-5	—
staining					
<b>Washing</b>	<b>III</b>		<b>ISO 3</b>	<b>ISO 3</b>	<b>ISO 2</b>
conditions	5		5	5	5
change	5		5	5	5
staining					
<b>NOTES ON APPLICATION AND USAGE</b>	<p>Stable pH 2-6 Slow dyeing, good levelling Dischargeable with C.I. Reducing Agent 2</p> <p><b>Acetate</b>—dyeing and printing Fastness(AATCC) light (C.arc), 4 wash (II), 5, 5 persp., 5, 4-5</p> <p><b>PVC fibres</b> dyed as complex with anionic surfactant Fastness(AATCC) light (C.arc), 4 wash (II), 4, 5</p>	<p><b>Paper</b> this is a major usage for this dye</p>	<p>Good discharge-ability in pale to medium depths</p>	<p>Good discharge-ability in pale to medium depths</p>	<p>Stable pH 3-5 Optimum pH for application: 4-4.5 Of particular interest for very bright, fluorescent greenish yellows</p>



41	42	43	44	45	C.I. Basic Yellow
Azo	Disazo	Polymethine	Polymethine	Azo-methine	<b>CHEMICAL CLASS</b>
—	—	—	—	—	<b>C.I. CONSTITUTION NO.</b>
ACRYLIC	ACRYLIC	<i>See Notes section</i>	<i>See Notes section</i>	ACRYLIC	<b>SUBSTRATE</b>
Reddish Yellow	Reddish Yellow	—	—	Bright Yellow	<b>HUE</b>
slightly redder	little change	—	—	redder	Artificial Light (tungsten)
4-5 5 1 4 —	— — — — —			4 4 4 4 5	<b>RESERVATION IN DYEBATH</b> cotton viscose wool nylon (type) polyester
AATCC Carbon arc 6 7 —  alk. 5 5  — — —  — — —  III 5 5	AATCC Carbon arc — 6-7 6-7  alk. 3 —  — — —  — — —  III A 4 5			ISO  daylight 6-7 7 7-8  alk. 5 5  intermediate 5 5  — — —  ISO 3 5 5	<b>FASTNESS</b> TEST METHODS  Light source pale medium heavy  Perspiration acid/alk. change staining  Pleating conditions (steam) change staining  Pressing conditions (dry) change after 2-4 hr staining  Washing conditions change staining
<b>Polyester</b> (basic dyeable) (Dacron 64) Fastness (AATCC) light (C.arc), 4, 5-6 persp. (alk.), 5, 5 wash (II), 5, 5		<b>Paper</b> resistant to acids and aluminium sulphate Discoloured by alkalies Low fastness to light	<b>Paper</b> resistant to acids and aluminium sulphate Discoloured by alkalies Low fastness to light	<b>Polyester</b> (basic dyeable) Suitable  <b>Nylon</b> (basic dyeable) Suitable	<b>NOTES ON APPLICATION AND USAGE</b>

**C.I. Basic Yellow 46—55**

<b>C.I. Basic Yellow</b>	<b>46</b>	<b>47</b>	<b>48</b>	<b>49</b>	<b>50</b>
<b>CHEMICAL CLASS</b>	Monoazo	Monoazo	Methine	Methine	Monoazo
<b>C.I. CONSTITUTION NO.</b>	—	—	—	—	—
<b>SUBSTRATE</b>	ACRYLIC	ACRYLIC	ACRYLIC	ACRYLIC	ACRYLIC
<b>HUE</b>	Yellow	Bright Yellow	Bright Yellow	Reddish Yellow	Reddish Yellow
Artificial Light (tungsten)	—	slightly redder	redder	redder	—
<b>RESERVATION IN DYE BATH</b>					
cotton	—	—	—	—	—
viscose	—	—	3	—	—
wool	—	—	3	—	—
nylon (type)	—	—	—	—	—
polyester	—	—	—	—	—
<b>FASTNESS</b>					
<b>TEST METHODS</b>	<b>ISO</b>	<b>AATCC</b>	<b>AATCC</b>	<b>ISO</b>	<b>AATCC</b>
<b>Light</b>	<b>daylight</b>	<b>Carbon arc</b>	<b>Carbon arc</b>	<b>daylight</b>	<b>daylight</b>
source	—	—	5	7-8	6-7
pale	6	5	7	7-8	6-7
medium	—	—	7	7-8	6-7
heavy	—	—	—	—	—
<b>Perspiration</b>	<b>alk.</b>	<b>—</b>	<b>alk.</b>	<b>alk.</b>	<b>—</b>
acid/alk.	5	—	5	4-5	—
change	—	—	5	5	—
staining	—	—	—	—	—
<b>Pleating</b>	<b>conditions</b>	<b>—</b>	<b>intermediate</b>	<b>intermediate</b>	<b>—</b>
(steam)	change	—	4-5	4-5	—
staining	—	—	—	4-5	—
<b>Pressing</b>	<b>conditions</b>	<b>—</b>	<b>15 sec/160°C</b>	<b>—</b>	<b>—</b>
(dry)	change	—	4	—	—
after 2-4 hr	—	—	5	—	—
staining	—	—	—	—	—
<b>Washing</b>	<b>conditions</b>	<b>ISO 1</b>	<b>III</b>	<b>ISO 3</b>	<b>III</b>
change	5	II A	5	4-5	5
staining	—	5	5	5	5
<b>NOTES ON APPLICATION AND USAGE</b>			<p>Rapid dyeing Stable pH 2-4.5 Suitable for high temperature dyeing (110°C)</p> <p>Acetate—dyeing and printing Fastness (AATCC) light (C. arc), 3 persp., 5, 4-5 wash (II), 4, 5</p>	Apply at pH 4-5	<p>Stable pH 3-7</p> <p><b>Polyester</b> (basic dyeable) Suitable</p>

51	52	53	54	55	C.I. Basic Yellow
Methine	Methine	Methine	Benzimidazole	Monoazo	<b>CHEMICAL CLASS</b>
—	—	—	—	—	<b>C.I. CONSTITUTION NO.</b>
ACRYLIC	ACRYLIC	ACRYLIC	ACRYLIC	ACRYLIC	<b>SUBSTRATE</b>
Bright Greenish Yellow	Reddish Yellow	Bright Yellow	Greenish Yellow (fluorescent)	Reddish Yellow	<b>HUE</b>
Redder	—	—	Redder, duller	little greener	Artificial Light (tungsten)
4-5 4-5 4-5 4-5 5				3 3 3 2-3 3-4	<b>RESERVATION IN DYEBATH</b> cotton viscose wool nylon (type) polyester
AATCC	AATCC	AATCC	ISO	AATCC	<b>FASTNESS</b> <b>TEST METHODS</b>
Carbon arc	Xenon arc	—	daylight	Carbon arc	Light source pale medium heavy
4-5	4-5	—	5-6	8	
5	5-6	7-8	6-7	8	
5-6	—	—	6-7	8	
alkaline	alkaline	alkaline	alkaline	alkaline	Perspiration acid/alk. change staining
4-5	4	4	5	5	
5	—	—	5	5	
intermediate	—	—	intermediate	intermediate	Pleating conditions (steam) change staining
4-5	—	—	4-5	4	
5	—	—	5	5	
—	—	—	15 sec/115°C	—	Pressing conditions (dry) change after 2-4 hr staining
—	—	—	5	—	
—	—	—	5	—	
—	—	—	5	—	
II	III	III	ISO 3	II	Washing conditions change staining
5	3	5	5	5	
5	5	5	5	5	
		<b>Polyester</b> (basic dyeable). Suitable  <b>Nylon</b> (basic dyeable). Suitable			<b>NOTES ON APPLICATION AND USAGE</b>





# C.I. Basic Orange 1—5

C.I. Basic Orange	1	2	3	4	5
<b>CHEMICAL CLASS</b>	Monoazo	Monoazo	Monoazo	Acridine	Acridine
<b>C.I. CONSTITUTION NO.</b>	11320	11270	—	46035 (related to)	46035 (related to)
<b>SUBSTRATE</b>	COTTON (tannin mordant)	COTTON (tannin mordant)	COTTON (tannin mordant)	COTTON (tannin mordant)	COTTON (tannin mordant)
<b>HUE</b>	Dull Yellowish Orange	Yellowish Orange →Orange	Bright Orange	Yellow→ Yellowish Orange	Bright Yellow→ Yellowish Orange
Artificial Light (tungsten)	brighter	brighter	—	—	—
<b>RESERVATION IN DYE BATH</b> cotton viscose wool nylon (type) polyester					
<b>FASTNESS</b>					
<b>TEST METHODS</b>	<b>B*</b>	<b>B*</b>		<b>C*</b>	<b>C*</b>
Light	source daylight	source daylight	Very similar in constitution and properties to C.I. Basic Orange 2	source daylight	source daylight
	1	1		1	1
	1	1		1	2
	2	2		2	3
Perspiration	acid/alk. change staining	acid/alk. change staining		—	—
	1	1		—	—
	—	—		—	—
Pleating (steam)	conditions change staining	conditions change staining		—	—
	—	—		—	—
	—	—		—	—
Pressing (dry)	conditions change after 2–4 hr staining	conditions change after 2–4 hr staining		—	—
	2–3	2–3		—	—
	—	—		—	—
	—	—		—	—
Washing	conditions change staining	conditions change staining		—	—
	1	1		2	3
	—	—		—	3–4
<b>NOTES ON APPLICATION AND USAGE</b>	Direct dyeing Dischargeable to white in pale hues only  <b>Silk</b> Fastness B* light, 1, 1, 1  <b>Wool</b> Fastness B* light, 1, 1, 1  <b>Bast fibres</b> <b>Paper</b> <b>Biological stain</b> <b>Indicator</b> <b>Leather.</b> On veg. tannages <b>Spirit Varnishes</b> <b>Wood Stains</b> See C.I. Solvent Orange 4	Direct dyeing Dischargeability (reduction) poor, (oxidation) fair Printing—steam volatile  <b>Wool</b> Fastness C* light, 1, 1–2, 2 washing, 1–2  <b>Bast fibres</b> <b>Silk</b> <b>Paper</b> <b>Biological Stain</b> <b>Leather</b> <b>Wood Stains</b> <b>Spirit Inks</b> <b>Varnishes</b> See C.I. Solvent Orange 3		Direct dyeing Not dischargeable Print with addition of sodium acetate to prevent tender- ing of cotton Suitable for illum- inated discharge prints and dyeing on discharged tannin mordant  <b>Wool</b> Fastness C* light, 1, 1, 1 washing, 1, 1–2  <b>Silk</b> Fastness C* light, 1, 1–2, 2  <b>Leather</b>	Direct dyeing Not dischargeable Suitable direct printing and dye- ing on discharged tannin mordant  <b>Bast fibres</b> <b>Silk</b> <b>Wool</b> <b>Leather</b> <b>Paper</b>

**C.I. Basic Orange 6—15**

<b>C.I. Basic Orange</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>
<b>CHEMICAL CLASS</b>	Acridine	Acridine	Acridine	Acridine	Acridine
<b>C.I. CONSTITUTION NO.</b>	46035 (related to)	46035 (related to)	46035 (related to)	46035 (related to)	46035 (related to)
<b>SUBSTRATE</b>	COTTON (tannin mordant)	COTTON (tannin mordant)	COTTON (tannin mordant)	COTTON (tannin mordant)	SILK
<b>HUE</b>	Bright Yellow → Yellowish Orange	Reddish Yellow → Brownish Orange	Reddish Orange	Orange → Reddish Orange	Orange
Artificial Light (tungsten)	—	—	—	—	—
<b>RESERVATION IN DYE BATH</b> cotton viscose wool nylon (type) polyester					
<b>FASTNESS</b> TEST METHODS	C*	C*	A*	C*	C*
Light	daylight	daylight	daylight	daylight	daylight
source	1	1	1	1	1
pale	2	2	2	1-2	1-2
medium	3	3	2	2	2
heavy	—	—	—	—	—
Perspiration	acid/alk. change staining	— — —	— — —	— — —	— — —
Pleating (steam)	conditions change staining	— — —	— — —	— — —	— — —
Pressing (dry)	conditions change after 2-4 hr staining	— — — —	— — — —	— — — —	— — — —
Washing	conditions change staining	— 2-3 3-4	— 2 2	— — —	— 4 5
<b>NOTES ON APPLICATION AND USAGE</b>	Direct dyeing Not dischargeable Suitable direct printing and dye- ing on discharged tannin mordant  Silk Wool Paper Leather	Direct dyeing Not dischargeable Suitable direct printing and dye- ing on discharged tannin mordant  Bast fibres Silk Wool Paper Leather	Direct dyeing Not dischargeable Suitable direct printing, as illum- inating colour in discharges and for dyeing on dis- charged tannin mordant  Bast fibres Silk Paper Leather	Direct dyeing Not dischargeable Suitable direct printing or as illuminating colour in discharges Unsuitable for dyeing on dis- charged tannin mordant  Wool Fastness C* light, 1, 1, 1-2  Silk. Suitable for printing, but poor affinity on dyeing  Paper Leather	Dyeing and print- ing  Cotton (tannin mordant) Fastness C* light, 1, 1-2, 2 washing 3-4 Suitable direct printing, as illum- inating colour in discharges and for dyeing on dis- charged tannin mordant  Wool Fastness C* light, 1, 1, 1-2  Paper Leather

11	12	13	14	15	C.I. Basic Orange
Acridine	Acridine	Acridine	Acridine	Acridine	<b>CHEMICAL CLASS</b>
46035 (related to)	—	—	46005	46045	<b>C.I. CONSTITUTION NO.</b>
COTTON (tannin mordant)	SILK	SILK	SILK	SILK	<b>SUBSTRATE</b>
Bright Yellowish Orange	Bright Orange	Bright Orange	Bright Yellowish Orange	Dull Orange → Brown	<b>HUE</b>
—	—	—	no change	—	Artificial Light (tungsten)
					<b>RESERVATION IN DYEBATH</b> cotton viscose wool nylon (type) polyester
<b>C*</b> daylight — 4 — — — — — — — — 2-3 —	<b>C*</b> daylight — 1 — — 1-2 — — — — — — 2 —	<b>C*</b> daylight — 1 — — 1 — — — — — — 2 —	<b>ISO</b> daylight 1 1-2 2 — alk. 3 1 — — — 5 5 — ISO 1 1 3	<b>C*</b> daylight — 3 — — — — — — — — 4 —	<b>FASTNESS</b> <b>TEST METHODS</b>  Light source pale medium heavy  Perspiration acid/alk. change staining  Pleating (steam) conditions change staining  Pressing (dry) conditions change after 2-4 hr staining  Washing conditions change staining
Not dischargeable Suitable direct dyeing and print- ing; for coloured resists and dyeing on discharged tannin mordant  <b>Wool</b>	Not dischargeable Suitable for illum- inated discharge printing and direct printing  <b>Cotton</b> (tannin mordant) Printing usage as for silk Fastness C* light, 2-3 washing, 2  <b>Wool</b> Printing usage as for silk	Printing: discharge and direct styles  <b>Cotton</b> (tannin mordant) Printing: discharge and direct styles Fastness C* light, 2-3 washing, 4	Dyeing and print- ing (direct and discharge styles)  <b>Cotton</b> (tannin mordant) Usage as silk Fastness C* light, 1, 1-2, 2 washing, 2  <b>Wool</b> Fastness C* light, 1, 1, 1-2  <b>Bast fibres</b> <b>Pigments</b> <b>Leather.</b> Chrome and veg. tannages <b>Spirit Inks</b> Free base is C.I. Solvent Orange 15	<b>Cotton</b> (tannin mordant) Direct dyeing and printing Suitable as illum- inating colour in discharges Fastness C* light, 3  <b>Leather</b>	<b>NOTES ON APPLICATION AND USAGE</b>

# C.I. Basic Orange 16—25

C.I. Basic Orange	16	17	18	19	20
<b>CHEMICAL CLASS</b>	Acridine	Acridine	Acridine	Acridine	—
<b>C.I. CONSTITUTION NO.</b>	<b>46045</b> (related to)	<b>46045</b> (related to)	<b>46070</b>	<b>46010</b>	—
<b>SUBSTRATE</b>		COTTON (tannin mordant)	COTTON (tannin mordant)	COTTON (tannin mordant)	SILK
<b>HUE</b>		Dull Orange	Reddish Orange	Reddish Orange	Dull Orange
Artificial Light (tungsten)		redder, weaker	—	—	—
<b>RESERVATION IN DYEBATH</b> cotton viscose wool nylon (type) polyester					
<b>FASTNESS</b> TEST METHODS		A*	C*	C*	C*
Light source		daylight	daylight	daylight	daylight
pale		1	1	1	1-2
medium		—	—	—	—
heavy		—	—	—	—
Perspiration acid/alk.		—	—	—	—
change		1-2	—	—	1-2
staining		—	—	—	—
Pleating conditions		—	—	—	—
(steam) change		—	—	—	—
staining		—	—	—	—
Pressing conditions		—	—	—	—
(dry) change		—	—	—	—
after 2-4 hr		—	—	—	—
staining		—	—	—	—
Washing conditions		—	—	—	—
change		2	2	2	1
staining		—	—	—	—
<b>NOTES ON APPLICATION AND USAGE</b>		Not dischargeable Suitable as illuminating colour in discharges  <b>Paper</b> <b>Leather.</b> Veg. tannages <b>Plastics</b>	Not dischargeable Suitable direct dyeing and printing; also as illuminating colour in discharges  <b>Leather</b>	Direct dyeing and printing  <b>Silk</b> Dye on tannin-antimony mordant Suitable as illuminating colour in discharge printing  <b>Leather</b>	<b>Cotton</b> (tannin mordant) Fastness C* light, 2 persp., 1 hot press., 2-3  <b>Leather</b> Veg. tannages



21	22	23	24	25	C.I. Basic Orange
Methine	Methine	Acridine	Monoazo	Monoazo	<b>CHEMICAL CLASS</b>
48035	48040	46075	—	—	<b>C.I. CONSTITUTION NO.</b>
ACRYLIC	ACRYLIC	COTTON (tannin mordant)	ACRYLIC	ACRYLIC	<b>SUBSTRATE</b>
Bright Yellowish Orange	Bright Orange	Dull Yellowish Orange	Bright Orange	Orange	<b>HUE</b>
redder	little redder	—	duller	redder	Artificial Light (tungsten)
4-5 4 4 4-5 4-5	4-5 4 4 4-5 4-5	— — — — —	3-4 4 3 3-4 4-5	— — — — —	<b>RESERVATION IN DYEBATH</b> cotton viscose wool nylon (type) polyester
ISO    AATCC	ISO    AATCC	C*	AATCC (Orlon 42) C. arc	AATCC (Orlon 42) daylight	<b>FASTNESS</b> TEST METHODS
day.    C. arc	Xe. arc    C. arc	daylight	7	6	Light    source
3-4    4-5	4    4-5	1	8	6-7	pale
4-5    5-6	5-6    5-6	1-2	—	—	medium
5-6    6-7	6    7	2	—	—	heavy
alk.    alk.	alk.    alk.	—	alk.	alk.	Perspiration    acid/alk.
4-5    5	4-5    5	—	4-5	4	change
4-5    5	4-5    5	—	5	—	staining
inter.    inter.	inter.    inter.	—	—	intermediate	Pleating    conditions
5    5	4-5    5	—	—	4-5	(steam)    change
4-5    4-5	4-5    5	—	—	—	staining
—    II	—    II	—	60 sec/160°C	—	Pressing    conditions
—    3	—    3	—	4-5	—	(dry)    change
—    5	—    5	—	—	—	after 2-4 hr
—    —	—    —	—	—	—	staining
ISO 3    III	ISO 3    III	—	III	III A	Washing    conditions
4-5    5	4    5	1-2	4-5	4-5	change
4-5    5	4    5	—	5	—	staining
Stable to 120°C Stable pH 2-8 (preferred 4-6) Moderate rate of dyeing Dischargeable (C.I. Reducing Agent 2)  <b>Acetate</b> Fastness (AATCC) light C. arc, 5 persp., 5, 4 wash II, 4-5, 5  <b>PVC fibres</b> Fastness (AATCC) light C. arc, 5 persp., 5, 5 wash II, 5, 5  <b>Modacrylic</b> light, C. arc 3-5 wash III, 4-5, 5  <b>Polyester</b> (basic dyeable) light C. arc, 3  <b>PVC fibres</b> light, C. arc, 5	Stable pH 2-6 Rapid dyeing Good stability in print pastes Suitable for illum- inated discharges  <b>Acetate</b> Fastness (AATCC) light C. arc, 5 persp., 5, 4 wash II, 4-5, 5  <b>PVC fibres</b> Fastness (AATCC) light C. arc, 5 persp., 5, 5 wash II, 5, 5	Direct dyeing and printing Suitable as illum- inating colour in reduction dis- charges Dischargeable by oxidation  <b>Wool</b> Fastness C* light, 1, 1, 1 washing, 1-2, 2  <b>Silk</b> <b>Leather</b>	Stable pH 4-5-8 Slow dyeing		<b>NOTES ON APPLICATION AND USAGE</b>

**C.I. Basic Orange 26—35**

<b>C.I. Basic Orange</b>	<b>26</b>	<b>27</b>	<b>28</b>	<b>29</b>	<b>30, 30:1†</b>
<b>CHEMICAL CLASS</b>	Monoazo	Methine	Monoazo	Monoazo	Monoazo
<b>C.I. CONSTITUTION NO.</b>	—	—	—	—	—
<b>SUBSTRATE</b>	ACRYLIC	ACRYLIC	ACRYLIC	ACRYLIC	ACRYLIC
<b>HUE</b>	Dull Orange	Bright Reddish Orange	Reddish Orange	Reddish Yellow	Dull Reddish Orange
Artificial Light (tungsten)	redder, brighter	redder, brighter	redder	little redder	redder
<b>RESERVATION IN DYE BATH</b>					
cotton	—	5	4	5	3
viscose	—	5	4	5	3
wool	—	5	4	4	2
nylon (type)	—	5	3	4	2
polyester	—	5	4	5	3
<b>FASTNESS</b>					
<b>TEST METHODS</b>	<b>AATCC</b> (Orlon 42) Carbon arc	<b>ISO</b> (Courtele) Xenon arc	<b>ISO</b> (Courtele) Xenon arc	<b>ISO</b> (Courtele) Xenon arc	<b>ISO</b> <b>AATCC</b>
Light      source					day.    C. arc
pale	6	5	6-7	6	6-7    6-7
medium	6-7	5-6	6-7	6-7	6-7    7
heavy	—	6	6-7	6-7	7      7
Perspiration    acid/alk.	alk.	alk.	alk.	alk.	alk.    alk.
change	4-5	5	4-5	5	4-5    5
staining	—	5	5	5	4-5    5
Pleating      conditions	intermediate	intermediate	intermediate	intermediate	inter.    inter.
(steam)      change	4-5	5	5	5	5      5
staining	—	4	4-5	4	4-5    4-5
Pressing      conditions	—	—	—	—	—      —
(dry)        change	—	3	4	4	4      —
after 2-4 hr	—	4	4	4	5      —
staining	—	—	4-5	4-5	5      —
Washing      conditions	III A	ISO 3	ISO 3	ISO 3	ISO 3    III
change	4-5	5	5	5	4-5    5
staining	—	5	5	5	5      5
<b>NOTES ON APPLICATION AND USAGE</b>	Slow dyeing	Not dischargeable Suitable as illuminating colour in discharges with stannous salts  <b>Silk</b> , printing Fastness (ISO) light, 3, 4, 5 persp., 4, 2 wash (1), 4, 2-3  <b>Acetate</b> , prints Fastness (ISO) light, 4-5, 5, 5 persp., 3-4, 2 wash (1), 3, 4-5	Dischargeable with C.I. Reducing Agent 2 in printing  <b>Acetate</b> , prints Fastness (ISO) light, 5, 5-6, 6 persp., 3, 1-2 wash (1), 3, 4-5  <b>Silk</b> , printing Fastness (ISO) light, 3, 4, 4-5 persp., 3-4, 2 wash (1), 4, 3-4	Dischargeable in printing with C.I. Reducing Agent 2  <b>Acetate</b> , prints Fastness (ISO) light, 4-5, 4-5, 5 persp., 3-4, 2 wash (1), 1-2, 4-5	Stable pH 2-6 Slow dyeing Dischargeable in printing with C.I. Reducing Agent 2  <b>Silk</b> , printing Fastness (ISO) light, 4, 5, 6 persp., 3-4, 1 wash (1), 3, 3  <b>Acetate</b> , prints Fastness (AATCC) light C. arc, 5-6 persp., 4, 4-5 wash II, 5, 5  †Slightly different chemically to Orange 30

31	32	33	34	35	C.I. Basic Orange
Monoazo	Azo	Azo	Azo	Monoazo	CHEMICAL CLASS
—	—	—	—	—	C.I. CONSTITUTION NO.
ACRYLIC	ACRYLIC	ACRYLIC	ACRYLIC	ACRYLIC	SUBSTRATE
Bright Reddish Orange	Orange	Reddish Orange	Yellowish Orange	Orange	HUE
yellower	little redder	little change	little redder	little redder	Artificial Light (tungsten)
5 5 3-4 5 —	— — — — —	2-3 2 2 — 2	3 3 3 — 4	4 3 4 5 5	RESERVATION IN DYEBATH cotton viscose wool nylon (type) polyester
AATCC — 4-5 6 —  — 4-5 —  — — — — III A 4-5 5	AATCC (Vonnell) Carbon arc 5-6 6 6-7  alk. 5 5  intermediate 5 5  15 sec/180°C 5 — — III 5 —	AATCC Carbon arc 4-5 5-6 6  alk. 5 5  intermediate 5 4-5  15 sec/180°C 5 — — III 5 5	AATCC Carbon arc 5 6 6-7  alk. 5 5  severe 5 5  — — — — III 5 5	ISO Xenon arc 5-6 6 6-7  alk. 5 5  intermediate 4-5 —  15 sec/115°C 5 — — ISO 3 4-5 5	FASTNESS TEST METHODS  Light source pale medium heavy  Perspiration acid/alk. change staining  Pleating conditions (steam) change staining —  Pressing conditions (dry) change after 2-4 hr staining —  Washing conditions change staining
Not dischargeable	Dischargeable to white	Dye in range pH 4-6	Dye in range pH 4-6	Good discharge-ability in pale hues	NOTES ON APPLICATION AND USAGE

**C.I. Basic Orange 36—45**

<b>C.I. Basic Orange</b>	<b>36</b>	<b>37</b>	<b>38</b>	<b>39</b>	<b>40</b>
<b>CHEMICAL CLASS</b>	Polyazo	Azo	Azo	Monoazo	Azo
<b>C.I. CONSTITUTION NO.</b>	—	—	—	—	—
<b>SUBSTRATE</b>	ACRYLIC	ACRYLIC	ACRYLIC	ACRYLIC	ACRYLIC
<b>HUE</b>	Bright Reddish Orange	Yellowish Orange	Bright Reddish Orange	Yellowish Orange	Yellowish Orange
Artificial Light (tungsten)	no change	little redder	little change	little redder	little redder
<b>RESERVATION IN DYE BATH</b>					
cotton	2-3	3	2-3	3-4	4
viscose	2-3	3	2-3	3	5
wool	2	2	3	3-4	4
nylon (type)	2-3	3-4	3	2	4 (6-6)
polyester	3	3-4	3-4	3-4	5
<b>FASTNESS</b>					
<b>TEST METHODS</b>	<b>ISO</b>	<b>ISO AATCC</b>	<b>ISO AATCC</b>	<b>AATCC</b>	<b>ISO</b>
		(Dralon)	(Dralon)	(Orlon 42)	(Dralon)
<b>Light</b> source	Xenon arc	day. C. arc	day. C. arc	Carbon arc	daylight
pale	6	6 6	5-6 5-6	6-7	5
medium	6-7	7 6-7	6-7 6	6-7	6
heavy	7	7 7	7 6-7	6-7	7
<b>Perspiration</b> acid/alk. change staining	alk. 4-5 4-5	alk. 5 5	alk. 5 5	alk. 5 5	alk. 4-5 5
<b>Pleating (steam)</b> conditions change staining	intermediate 5 —	severe 5 5	severe 5 5	intermediate 5 4-5	mild 4-5 5
<b>Pressing (dry)</b> conditions change after 2-4 hr staining	15 sec/115°C 5 — —	15 sec/140°C — 4 5 —	15 sec/140°C — 5 5 —	60 sec/160°C 4-5 — 5	— 3-4 5 —
<b>Washing</b> conditions change staining	ISO 3 4-5 5	ISO 1 5 5	ISO 1 5 5	III 5 5	ISO 3 4-5 5
<b>NOTES ON APPLICATION AND USAGE</b>	Good discharge-ability in pale hues	Good levelling Dischargeable	Good levelling Dischargeable	Stable pH 4-8 Moderate dyeing rate, good build up Suitable pressure dyeing  <b>Polyester</b> (basic dyeable) light C. arc, 4-5 wash III, 5, 5	



41	42	43	44	45	C.I. Basic Orange
Azo	Azo-methine-azo	Monoazo	Methine	Monoazo	CHEMICAL CLASS
—	—	—	—	—	C.I. CONSTITUTION NO.
ACRYLIC	ACRYLIC	ACRYLIC	ACRYLIC	ACRYLIC	SUBSTRATE
Bright Orange	Orange	Bright Reddish Orange	Bright Reddish Orange	Reddish Orange	HUE
redder	little redder	—	yellower	little redder	Artificial Light (tungsten)
4 3 3-4 2 (6-6) 3-4	— — — — —	— — — — —	— — — — —	3 1 2 3-4 4	RESERVATION IN DYEBATH cotton viscose wool nylon (type) polyester
ISO (Dralon) daylight 6-7 7 7-8  alk. 4-5 4-5  mild 4-5 4-5  — 2-3 4 —  ISO 3 4-5 4-5	ISO Xenon arc 6 6-7 6-7  alk. 5 4-5  — — —  — — —  ISO 3 5 4-5	ISO daylight 6-7 6-7 6-7  alk. 4-5 5  — — —  — — —  ISO 3 4-5 5	ISO Xenon arc 6 6-7 6-7  alk. 5 5  — — —  — — —  ISO 3 4-5 5	ISO daylight 5 5-6 6  alk. 5 4-5  intermediate 4-5 4-5  — — —  — — —  ISO 3 5 4-5	FASTNESS TEST METHODS  Light source pale medium heavy  Perspiration acid/alk. change staining  Pleating conditions (steam) change staining  Pressing conditions (dry) change after 2-4 hr staining  Washing conditions change staining
		Dischargeable to white in pale to medium hues with C.I. Reducing Agent 2 in printing		Dischargeable to white	NOTES ON APPLICATION AND USAGE

**C.I. Basic Orange 46—48**

<b>C.I. Basic Orange</b>	<b>46</b>	<b>47</b>	<b>48</b>	
<b>CHEMICAL CLASS</b>	Methine	Azo	Azo	
<b>C.I. CONSTITUTION NO.</b>	—	—	—	
<b>SUBSTRATE</b>	ACRYLIC	ACRYLIC	ACRYLIC	
<b>HUE</b>	Reddish Orange	Bright Reddish Orange	Yellowish Orange	
Artificial Light (tungsten)	redder	little yellower	redder	
<b>RESERVATION IN DYEBATH</b>				
cotton	—	—	4-5	
viscose	—	—	4	
wool	—	—	2-3	
nylon (type)	—	—	2-3 (6-6)	
polyester	—	—	4	
<b>FASTNESS</b>				
<b>TEST METHODS</b>	<b>AATCC</b>	<b>ISO</b>	<b>ISO</b>	
<b>Light</b> source	Carbon arc	daylight	daylight	
pale	3-4	5-6	6	
medium	4	6	6-7	
heavy	4-5	6-7	7	
<b>Perspiration</b> acid/alk.	acid	alk.	alk.	
change	5	5	5	
staining	4-5	5	5	
<b>Pleating</b> conditions	—	—	intermediate	
<b>(steam)</b> change	—	—	4-5	
staining	—	—	4-5	
<b>Pressing</b> conditions	—	—	—	
<b>(dry)</b> change	—	5	4	
after 2-4 hr	—	—	4-5	
staining	—	—	5	
<b>Washing</b> conditions	III	ISO 3	ISO 3	
change	4-5	5	5	
staining	5	5	5	
<b>NOTES ON APPLICATION AND USAGE</b>			Dischargeable in pale hues  <b>Polyester</b> (basic dyeable) light, Xe. arc, 5 persp., 4-5, 5 wash (3), 5, 5	

# C.I. Basic Red 1—4

C.I. Basic Red	1, 1:1		2	3	4
CHEMICAL CLASS	Xanthene		Azine	Xanthene	Xanthene
C.I. CONSTITUTION NO.	45160 (1:1 is similar)		50240	45210	45215
SUBSTRATE	SILK	COTTON (tannin mordant)	COTTON (tannin mordant)	COTTON (tannin mordant)	COTTON (tannin mordant)
HUE	Bluish Pink (fluorescent)	Bluish Pink (fluorescent)	Bright Bluish Pink	Bright Bluish Pink	Bright Bluish Pink
Artificial Light (tungsten)	yellower	yellower	brighter	—	—
RESERVATION IN DYEBATH					
cotton	2	—	—	—	—
viscose	2	—	—	—	—
wool	2	—	—	—	—
nylon (type)	4	—	—	—	—
polyester	2	—	—	—	—
FASTNESS					
TEST METHODS	ISO	C*	C*	B*	C*
Light	source	daylight	daylight	daylight	daylight
pale	2	1	1	1	1
medium	2	1	1-2	1	1
heavy	2	2	2	2	1
Perspiration	acid/alk. change staining	alkaline — — —	— — 2 —	— — 1 —	— — — —
Pleating (steam)	conditions change staining	— — —	— — —	— — —	— — —
Pressing (dry)	conditions change after 2-4 hr staining	— — — —	— — 2-3 — —	— — 2-3 — —	— — — — —
Washing	conditions change staining	ISO 1 3 3-4	— 2-3 5	— 2-3 5	— 1 —
NOTES ON APPLICATION AND USAGE	<p>Suitable direct dyeing, printing For illuminated discharges</p> <p><b>Wool</b>—Fastness C*, light, 1, 1, 2</p> <p><b>Bast fibres</b> <b>Paper</b>—widely used <b>Pigments</b>—with high mol. wt. acids for printing inks, drawing inks, crayons, pastels, etc. Fastness generally poor except in C.I. Pigment Red 81 <b>Leather</b>—chrome and vegetable tannages. Fastness generally poor <b>Solvent dye</b>—base dissolved in stearic acid</p>		<p>Not dischargeable but unsuitable for illuminated discharges</p> <p><b>Wool</b> Fastness C* light, 1, 1, 1 washing, 2-3, 4</p> <p><b>Silk</b> Fastness C* light, 1, 1, 1 <b>Leather</b> <b>Paper</b> <b>Biological Stain</b> <b>Pigments</b> <b>Spirit Inks</b> <b>Solvent dye</b>—free base gives dull bordeaux hues</p>	<p>Also dyeing on synthetic mordant or oil, discharged tannin mordant As illuminating colour in discharges</p> <p><b>Wool</b> <b>Silk</b> <b>Paper</b> <b>Leather</b> <b>Pigments</b> <b>Lacquers</b> <b>Spirit Inks</b> <b>Wood Stains</b></p>	<p>Not dischargeable</p> <p><b>Wool</b> Fastness C* light, 2, 3, 3, washing, 3, 2-3</p> <p><b>Silk</b> Fastness C* light, 1, 2, 2 washing, 2-3</p> <p>Similar in general usage to C.I. Basic Red 3</p>

C.I. Basic Red	5	6	7	8	9
<b>CHEMICAL CLASS</b>	Azine	Azine	—	Xanthene	Triarylmethane
<b>C.I. CONSTITUTION NO.</b>	50040	50375	—	45150	42500
<b>SUBSTRATE</b>	See Notes Section	SILK	COTTON (tannin mordant)	COTTON (tannin mordant)	COTTON (tannin mordant)
<b>HUE</b>	Reddish Violet→ Red	Pink	Red	Bright Bluish Red	Bright Bluish Red
Artificial Light (tungsten)	—	—	—	—	yellower
<b>RESERVATION IN DYEBATH</b> cotton viscose wool nylon (type) polyester					
<b>FASTNESS</b> TEST METHODS			C*	C*	A*
Light      source			daylight	daylight	—
pale			1	1	—
medium			—	2	2
heavy			—	—	—
Perspiration    acid/alk.			—	—	—
change			—	—	1
staining			—	—	—
Pleating (steam)      conditions			—	—	—
change			—	—	—
staining			—	—	—
Pressing (dry)        conditions			—	—	—
change			—	—	—
after 2-4 hr			—	—	—
staining			—	—	—
Washing      conditions			—	—	II
change			1	2	2
staining			—	5	—
<b>NOTES ON APPLICATION AND USAGE</b>	This dye has limited use for special purposes, for example: biological stains, desensitising photographic emulsions, and as an indicator	Very limited use for production of delicate fluorescent pink hues  Dyed from a soap bath	Dischargeable with C.I. Reducing Agent 1  Coir  Leather Paper	Not dischargeable Unsuitable as illuminating colour in discharges Suitable direct dyeing, printing and dyeing on discharged tannin mordant Wool Fastness C* light, 1, 1, 2  Silk Leather Paper Solvent dye—base dissolved in stearic acid Pigments—see C.I. Pigment Red 82	Suitable for dyeing  Silk Suitable for dyeing  Acrylics Suitable for dyeing, printing  Leather Paper Biological Stain



10	11	12	13	14	C.I. Basic Red
Azine	Xanthene	Methine	Methine	Cyanine	CHEMICAL CLASS
50250	45050	48070	48015	—	C.I. CONSTITUTION NO.
COTTON (tannin mordant)	COTTON (tannin mordant)	SILK	ACRYLIC	ACRYLIC	SUBSTRATE
Bright Bluish Pink	Pink	Bluish Pink (fluorescent)	Pink (fluorescent)	Bright Red (fluorescent)	HUE
—	—	yellower	yellower	yellower	Artificial Light (tungsten)
— — — — —	— — — — —	— — — — —	3-4 3-4 3 3-4 5	4 3 3-4 4-5 5	RESERVATION IN DYEBATH cotton viscose wool nylon (type) polyester
C* daylight 1 2 2 — 2 — — — — 3 — — 1 —	C* daylight 1 1 2 — — — — — — — 1 —	B* daylight 1-2 1-2 2 — — — — — — — 3-4 5	ISO AATCC Xe. arc C. arc 4 4-5 4 5 4 5-6 alk. alk. 4-5 5 4 5 inter. inter. 5 4-5 4-5 — — 160°C/15" 4-5 1 4-5 5 — — ISO 3 III 4 4-5 4-5 4-5	ISO AATCC day. C. arc 3 4-5 4 4-5 4-5 5 alk. alk. 4-5 5 5 5 inter. inter. 4 4-5 5 — — 160°C/15" 2-3 2 4-5 5 5 — ISO 3 III 4-5 4-5 5 5	FASTNESS TEST METHODS Light source pale medium heavy Perspiration acid/alk. change staining Pleating conditions (steam) change staining Pressing conditions (dry) change after 2-4 hr staining Washing conditions change staining
Wool	Not dischargeable Applicable also on oil and synthetic mordants Direct printing, illuminated dis- charges, dyeing on discharged tannin mordant  Wool Fastness, C* light, 2, 3, 3  Silk Fastness, C* light, 1, 2, 2  Leather—chrome and vegetable tannages	Dischargeable  Cotton (tannin mordant) Fastness B* light, 1, 1-2, 1-2 wash (2), 3-4, 4 Not dischargeable  Acetate Fastness A* light, 1-2 washing, 3  Nylon Fastness, A* light, 1-2 washing, 5  Bast fibres Paper Carbon Paper Distempers Pigments Leather	Stable pH 2-6 Suitable for printing Dischargeable with C.I. Reducing Agent 1  Acetate (print) Fastness, AATCC light (C. arc), 4 persp., 4-5, 2-3 wash II, 4-5, 5  PVC fibres Dye as complex with anionic surfactant	Stable pH 2-6 Moderate dyeing rate, good levelling, good build up  Acetate (print) Fastness (AATCC) light, 3-4 persp., 4-5, 2-3 wash II, 4-5, 5  Modacrylics  PVC fibres—dye as complex with anionic surfactant Fastness, AATCC light, 5 wash II, 5, 5  Polyester (basic dyeable)	NOTES ON APPLICATION AND USAGE

**C.I. Basic Red 15—24**

C.I. Basic Red	15	16	17	18, 18:1	19
<b>CHEMICAL CLASS</b>	Methine	Triarylmethane	Monoazo	Monoazo	Xanthene
<b>C.I. CONSTITUTION NO.</b>	—	—	—	<b>11085</b> (18:1 is similar)	—
<b>SUBSTRATE</b>	ACRYLIC	ACRYLIC	ACRYLIC	ACRYLIC	POLYESTER
<b>HUE</b>	Bluish Red (fluorescent)	Dull Bordeaux	Red	Dull Red	Bluish Pink (fluorescent)
Artificial Light (tungsten)	little yellower	yellower	yellower, duller	yellower, duller	yellower
<b>RESERVATION IN DYEBATH</b>					
cotton	4	3-4	3-4	3	—
viscose	4	4	3-4	3	—
wool	4	3	2	3	—
nylon (type)	4-5	3	2	3	—
polyester	5	5	3-4	3	—
<b>FASTNESS</b> TEST METHODS	ISO AATCC	AATCC	ISO AATCC	ISO AATCC	AATCC
Light source	day.	Carbon arc	day.	day.	Carbon arc
pale	3	5	6	6-7	—
medium	4	5-6	6-7	6-7	3-4
heavy	4-5	5-6	7	7	—
Perspiration acid/alk.	alk.	alkaline	alk.	alk.	alkaline
change	4-5	5	5	4-5	4-5
staining	5	5	5	5	—
Pleating (steam) conditions	inter.	intermediate	inter.	inter.	—
change	4	4-5	4-5	4-5	—
staining	4-5	5	5	4-5	—
Pressing (dry) conditions	—	—	—	—	—
change	—	—	—	160°C/15"	—
after 2-4 hr	—	—	—	3-4	3
staining	—	—	—	4-5	5
Washing conditions	ISO 3	III	ISO 3	ISO 3	III A
change	4-5	5	4-5	4-5	4
staining	5	5	5	5	—
<b>NOTES ON APPLICATION AND USAGE</b>	Stable pH 4-7 Moderate dyeing rate, excellent build up  <b>Modacrylics</b> Suitable  <b>Polyester</b> (basic dyeable) Fastness, ISO light (Xe), 3	Stable pH 3-6 and up to 120°C Slow dyeing rate, good build-up  <b>Modacrylics</b> Suitable for some types	Stable pH 4-8 Moderate dyeing rate Dischargeable to white	Stable pH 3-7 Moderate dyeing rate, good build-up  <b>Modacrylics</b> Suitable but has lower light fastness  <b>Acetate (print)</b> Fastness, AATCC light (C.arc), 5-6 persp., 3, 4 wash II, 4-5, 5  <b>Polyester</b> (basic dyeable) daylight, 3, 3-4	Dye at the boil and under pressure at 110°C Good build up  <b>Acrylic fibres</b> Also suitable

20	21	22	23	24	C.I. Basic Red
Xanthene		Azo	Monoazo	Monoazo	CHEMICAL CLASS
—		—	—	—	C.I. CONSTITUTION NO.
POLYESTER		ACRYLIC	ACRYLIC	ACRYLIC	SUBSTRATE
Yellowish Pink		Bright Bluish Red	Red	Dull Bluish Red	HUE
yellower		yellower, brighter	yellower, brighter	little yellower	Artificial Light (tungsten)
—		4-5	3	5	RESERVATION IN DYEBATH cotton viscose wool nylon (type) polyester
—		4-5	3	5	
—		4	3	5	
—		4	3	5	
—		5	4	5	
AATCC		ISO AATCC	ISO	ISO	FASTNESS TEST METHODS
Carbon arc		day. day.	(Courtele) Xenon arc	(Courtele) Xenon arc	
—		6-7 —	6-7	6	
3-4		7 8	7	6	
—		7 —	7	6-7	
alkaline	This C.I. Generic Name <sub>1</sub> is discontinued	alk. alk.	alkaline	alkaline	Perspiration acid/alk. change staining
4-5		4-5 —	4-5	5	
—		5 5	5	5	
—		inter. —	intermediate	intermediate	Pleating conditions (steam) change staining
—		5 —	5	5	
—		4 —	4	4-5	
—		160°C/30" —	—	—	Pressing conditions (dry) change after 2-4 hr staining
—		5 —	4-5	—	
—		— —	4-5	—	
—		5 —	—	—	
III A		ISO 3 III	ISO 3	ISO 3	Washing conditions change staining
4		4-5 5	4-5	5	
—		5 5	5	5	
Dye at the boil and under pressure at 110°C Good build up		Rapid dyeing Good build up Good levelling	Silk (print) Fastness, ISO daylight, 2, 4, 5 persp., 4, 2-3 wash (1), 4, 3	Dischargeable	NOTES ON APPLICATION AND USAGE
Acrylic fibres Also suitable		Modacrylics Fastness, ISO daylight, 6-7, 7 Polyester (basic dyeable) Fastness, ISO daylight, 4-5, 5-6	Acetate (print)		

**C.I. Basic Red 25—34**

<b>C.I. Basic Red</b>	<b>25</b>	<b>26</b>	<b>27</b>	<b>28</b>	<b>29</b>
<b>CHEMICAL CLASS</b>	Monoazo	Triarylmethane	Methine	—	Monoazo
<b>C.I. CONSTITUTION NO.</b>	—	—	—	—	—
<b>SUBSTRATE</b>	ACRYLIC	ACRYLIC	ACRYLIC	ACRYLIC	ACRYLIC
<b>HUE</b>	Red	Bright Bluish Red	Bright Red	Yellowish Red (fluorescent)	Red
Artificial Light (tungsten)	yellower, brighter	—	yellower	little yellower	yellower
<b>RESERVATION IN DYE BATH</b>					
cotton	2	2-3	3-4	3-4	—
viscose	2	2-3	3-4	3-4	—
wool	2	2-3	3-4	5	—
nylon (type)	2	2	4-5	3-4	—
polyester	4	4-5	5	3-4	—
<b>FASTNESS</b>					
<b>TEST METHODS</b>					
<b>Light</b>	source	ISO (Courtelle)	ISO (Orlon 42)	ISO (Courtelle)	ISO
	Xenon arc	daylight	daylight	Xenon arc	daylight
	pale	6-7	4	—	7
	medium	7	5	4	7-8
	heavy	7	5	—	7-8
<b>Perspiration</b>	acid/alk. change staining	alkaline	alkaline	alkaline	alkaline
		5	4-5	5	5
		5	5	5	5
<b>Pleating (steam)</b>	conditions change staining	intermediate	—	intermediate	—
		5	—	4	—
		4-5	—	5	—
<b>Pressing (dry)</b>	conditions change after 2-4 hr staining	—	180°C/30sec	—	180°C/30sec
		—	4	3-4	4-5
		—	—	4	—
		—	4	—	5
<b>Washing</b>	conditions change staining	ISO 3	ISO 3	ISO 3	ISO 3
		5	4-5	4-5	4-5
		5	5	5	5
<b>NOTES ON APPLICATION AND USAGE</b>	Dischargeable		Completely stable even under slightly alkaline conditions and at temperatures up to 130°C Changes hue under heat treatments (dry and wet)  <b>Modacrylics</b> Fastness, ISO light, 3-4, 4  <b>Polyester</b> (basic dyeable) Fastness, ISO light, 3, 3	<b>Paper</b>	



30	31	32	33	34	C.I. Basic Red
Monoazo —  ACRYLIC  Bright Yellowish Red yellower		Azo  —  ACRYLIC  Red  little yellower		Azo  —  ACRYLIC  Bluish Red  yellower	CHEMICAL CLASS  C.I. CONSTITUTION NO.  SUBSTRATE  HUE  Artificial Light (tungsten)
5 5 5 5 5		— — — — —		— — — — —	RESERVATION IN DYE BATH cotton viscose wool nylon (type) polyester
AATCC  — 7 7 — 4-5 —  — — —  — — — — III A 4-5 5	This C.I. Generic Name is discontinued. Dyes formerly listed under it now appear under C.I. Basic Red 22	AATCC (Vonnel) Carbon arc 4-5 5 5  alkaline 5 5  severe 5 —  180°C/15 sec 5 — — III 5 —	This C.I. Generic Name is discontinued. Dyes formerly listed under it now appear under C.I. Basic Red 18	AATCC (Vonnel) Carbon arc 5-6 6-7 7  alkaline 5 5  severe 4-5 —  180°C/15 sec 5 — — III 5 5	FASTNESS TEST METHODS  Light source pale medium heavy  Perspiration acid/alk. change staining  Pleating conditions (steam) change staining  Pressing conditions (dry) change after 2-4 hr staining  Washing conditions change staining
Not dischargeable				Dischargeable to white	NOTES ON APPLICATION AND USAGE

C.I. Basic Red	35	36	37	38	39
<b>CHEMICAL CLASS</b>	Methine	Methine	Methine	Azo	Azo
<b>C.I. CONSTITUTION NO.</b>	—	—	—	—	—
<b>SUBSTRATE</b>	ACRYLIC	ACRYLIC	ACRYLIC	ACRYLIC	ACRYLIC
<b>HUE</b>	Bright Bluish Red	Bluish Red (fluorescent)	Yellowish Red (fluorescent)	Red	Bluish Red
Artificial Light (tungsten)	yellower	yellower	yellower	yellower	yellower
<b>RESERVATION IN DYE BATH</b>					
cotton	—	—	—	—	—
viscose	—	5	5	4-5	4
wool	—	5	5	4	4
nylon (type)	—	—	—	—	—
polyester	—	—	—	—	—
<b>FASTNESS</b>					
<b>TEST METHODS</b>	AATCC (Vonnell)	AATCC	AATCC	AATCC	AATCC
<b>Light</b> source	Carbon arc	Carbon arc	Carbon arc	Carbon arc	Carbon arc
pale	3-4	4-5	4-5	6-7	6-7
medium	5	5	5	7-8	7
heavy	5-6	5	5-6	7-8	7-8
<b>Perspiration</b> acid/alk.	alkaline	alkaline	alkaline	alkaline	alkaline
change	5	5	5	5	5
staining	5	5	5	5	5
<b>Pleating</b> conditions	severe	intermediate	intermediate	intermediate	intermediate
(steam) change	4-5	5	4	5	4-5
staining	—	—	—	—	—
<b>Pressing</b> conditions	180°C/15 sec	160°C/15 sec	160°C/15 sec	160°C/15 sec	160°C/15 sec
(dry) change	5	1	2	3-4	2
after 2-4 hr	—	5	5	5	5
staining	—	—	—	—	—
<b>Washing</b> conditions	III	III	III	III	III
change	5	5	5	5	5
staining	5	5	5	5	5
<b>NOTES ON APPLICATION AND USAGE</b>	Good build up	Stable pH 3-5 Rapid dyeing Dischargeable with C.I. Reducing Agent 1 Suitable for coloured dis- charges with stannous chloride  <b>Acetate</b> Fastness, AATCC light (C. arc), 4 persp., 5, 3 wash II, 5, 5  <b>PVC fibres</b>	Stable pH 2-6 Rapid dyeing Dischargeable with C.I. Reducing Agent 1 Suitable for coloured dis- charges with stannous chloride  <b>PVC fibres</b> —dye as complex with anionic surfactant	Stable pH 2-4.5 Slow dyeing Good levelling Dischargeable	Stable pH 2-4.5 Rapid dyeing Dischargeable

40	41	42	43	44	C.I. Basic Red
Azo	Monoazo	Monoazo	Monoazo	Azo	CHEMICAL CLASS
—	—	—	—	—	C.I. CONSTITUTION NO.
ACRYLIC	ACRYLIC	ACRYLIC	ACRYLIC	ACRYLIC	SUBSTRATE
Dull Bluish Red	Yellowish Red	Bluish Red	Reddish Violet	Red	HUE
yellower	little yellower	little yellower	little yellower	unchanged	Artificial Light (tungsten)
— 4 2-3 — —	3 3 4 5 5	4 2 3 3 4	4 3 5 4 5	3 2-3 3-4 3 3-4	RESERVATION IN DYEBATH cotton viscose wool nylon (type) polyester
AATCC	ISO	ISO	ISO	ISO AATCC	FASTNESS TEST METHODS
Carbon arc 6 7 7	daylight 5 5-6 6	daylight 4-5 5 5-6	daylight 5-6 6 6-7	day. 6-7 6-7 6-7	C. arc 5-6 5-6 6
alkaline 5 5	alkaline 5 5	alkaline 4-5 4-5	alkaline 4-5 5	alk. 5 5	— — —
intermediate 5 —	intermediate 4-5 —	intermediate 4 —	intermediate 4-5 —	severe 5 4-5	— — —
160°C/15 sec 4 5 —	180°C/30 sec 5 — 5	180°C/30 sec 4-5 — 4	180°C/15 sec 4-5 — 4-5	140°C/15" 4 5 —	— — —
III 5 5	ISO 3 5 5	ISO 3 4-5 4-5	ISO 3 4-5 5	ISO 1 5 5	III 5 5
Stable pH 3-6 Rapid dyeing Particularly suitable for medium and heavy dyeings	Dischargeable in pale and medium hues	Dischargeable in pale and medium hues	Dischargeable in pale and medium hues	Dischargeable to white with C.I. Reducing Agent 4	NOTES ON APPLICATION AND USAGE
Acetate Fastness, AATCC light (C. arc), 5-6 persp., 3-4, 4-5 wash II, 5, 5					

**C.I. Basic Red 45—54**

<b>C.I. Basic Red</b>	<b>45</b>	<b>46</b>	<b>47</b>	<b>48</b>	<b>49</b>
<b>CHEMICAL CLASS</b>	Azomethine	Monoazo	Monoazo	Methine	Methine
<b>C.I. CONSTITUTION NO.</b>	—	—	—	—	—
<b>SUBSTRATE</b>	ACRYLIC	ACRYLIC	ACRYLIC	ACRYLIC	ACRYLIC
<b>HUE</b>	Bluish Red	Bright Bluish Red	Red	Yellowish Red (fluorescent)	Bluish Red (fluorescent)
Artificial Light (tungsten)	yellower	yellower	—	little bluer	yellower
<b>RESERVATION IN DYEBATH</b>					
cotton	—	4-5	—	4-5	4-5
viscose	—	4-5	—	5	4
wool	—	3	—	3-4	3-4
nylon (type)	—	3-4	—	3-4	3-4
polyester	—	4-5	—	5	5
<b>FASTNESS</b>					
<b>TEST METHODS</b>	<b>ISO</b>	<b>ISO</b>	<b>AATCC</b>	<b>AATCC</b>	<b>AATCC</b>
<b>Light</b> source	Xenon arc	day. Xe. arc	Carbon arc	Carbon arc	Carbon arc
pale	6	6-7 5-6	4	4-5	4-5
medium	6-7	7 6	4-5	5-6	3-4
heavy	6-7	7 6-7	—	6	3-4
<b>Perspiration</b> acid/alk.	alkaline	alkaline	alkaline	alkaline	alkaline
change	5	5	4	4-5	5
staining	5	5	—	5	5
<b>Pleating</b> conditions	—	intermediate	—	intermediate	intermediate
(steam) change	—	4	—	3	4
staining	—	5	—	—	5
<b>Pressing</b> conditions	—	160°C/30 sec	—	160°C/60 sec	160°C/60 sec
(dry) change	5	5	—	3-4	4-5
after 2-4 hr	5	5	—	—	—
staining	5	5	—	—	—
<b>Washing</b> conditions	ISO 3	ISO 3	III A	III	III
change	5	5	3	4	4-5
staining	5	5	5	5	5
<b>NOTES ON APPLICATION AND USAGE</b>		<p>Stable, even under alkaline conditions and up to 130°C</p> <p><b>Modacrylics</b> Fastness, ISO daylight, 6, 6-7 wash (3), 5, 5</p> <p><b>Polyester</b> (basic dyeable) Fastness, ISO daylight, 4, 5-6 wash (3), 5, 5</p>		<p>Stable pH 2-7 Moderate dyeing rate Good fastness to durable press finishes</p> <p><b>Polyester</b> (basic dyeable) Hue bluish red Fastness, AATCC light (C. arc), 2-3</p>	<p>Stable pH 2-7 Rapid dyeing</p> <p><b>Modacrylics</b> Hue bluer Fastness, AATCC light (C. arc), 3-4</p> <p><b>Polyester</b> (basic dyeable) Hue bluer Fastness, AATCC light (C. arc), 2</p>



50	51	52	53	54	C.I. Basic Red
Azo	Azo	Methine	Methine	Monoazo	CHEMICAL CLASS
—	—	—	—	—	C.I. CONSTITUTION NO.
ACRYLIC	ACRYLIC	ACRYLIC	ACRYLIC	ACRYLIC	SUBSTRATE
Bluish Red	Bluish Red	Bluish Red (fluorescent)	Bluish Red (fluorescent)	Red	HUE
yellower	yellower	yellower	yellower	yellower	Artificial Light (tungsten)
4 4-5 4-5 4 5	4-5 4-5 5 4-5 5	4-5 5 5 5 5	4-5 5 5 5 5	— — — — —	RESERVATION IN DYEBATH cotton viscose wool nylon (type) polyester
ISO day.    Xe.arc 5        4-5 6        6 7        7  alkaline 5 5  intermediate 4-5 4-5  — 3-4 5 —  ISO 3 4-5 5	ISO day.    Xe.arc 5        5 6        6 6-7      6-7  alkaline 4-5 4-5  intermediate 4-5 4-5  — 3 4-5 —  ISO 3 4-5 4-5	ISO day.    Xe.arc 2        2-3 3        3 4        4  alkaline 4-5 4-5  intermediate 4-5 4  — 2 4-5 —  ISO 3 4-5 4-5	ISO day.    Xe.arc 2        2-3 2-3      3 3        3  alkaline 4-5 4-5  intermediate 4-5 4  — 2 4-5 —  ISO 3 4-5 4-5	ISO daylight 7 7 7  alkaline 4-5 —  — — — — —  ISO 3 4-5 5	FASTNESS TEST METHODS  Light        source pale medium heavy  Perspiration    acid/alk. change staining  Pleating        conditions (steam)        change staining  Pressing        conditions (dry)            change after 2-4 hr staining  Washing        conditions change staining
	Acetate Triacetate Both by printing only				NOTES ON APPLICATION AND USAGE

C.I. Basic Red	55	56	57	58	59
<b>CHEMICAL CLASS</b>	Monoazo	Monoazo	Disazo	Monoazo	Monoazo
<b>C.I. CONSTITUTION NO.</b>	—	—	—	—	—
<b>SUBSTRATE</b>	ACRYLIC	ACRYLIC	ACRYLIC	ACRYLIC	ACRYLIC
<b>HUE</b>	Yellowish Red	Bordeaux	Yellowish Red	Red	Bordeaux
Artificial Light (tungsten)	yellower	yellower	little yellower	yellower	yellower
<b>RESERVATION IN DYEBATH</b>					
cotton	3	3	1	4-5	—
viscose	3	2-3	1	4	—
wool	3	3	3	4	—
nylon (type)	3	3(6-6)	3-4	4	—
polyester	4	3-4	3-4	5	—
<b>FASTNESS</b>					
<b>TEST METHODS</b>	ISO	ISO	ISO	ISO	ISO
<b>Light</b> source	daylight	daylight	day. Xe. arc	day. Xe. arc	daylight
pale	6-7	6	6 5-6	5-6 5-6	7
medium	6-7	6	6-7 6	6 6	7
heavy	6-7	6-7	7 6-7	7 7	7-8
<b>Perspiration</b> acid/alk.	alkaline	alkaline	alkaline	alkaline	alkaline
change	5	5	5	5	4-5
staining	5	5	5	5	5
<b>Pleating (steam)</b> conditions	intermediate	intermediate	intermediate	intermediate	—
change	5	5	5	5	—
staining	4-5	4-5	—	—	—
<b>Pressing (dry)</b> conditions	—	—	180°C/30 sec	180°C/30 sec	—
change	4	4	5	5	—
after 2-4 hr	5	5	—	5	—
staining	5	5	5	5	—
<b>Washing</b> conditions	ISO 3	ISO 3	ISO 3	ISO 3	ISO 3
change	5	4-5	5	5	4-5
staining	5	4-5	5	5	5
<b>NOTES ON APPLICATION AND USAGE</b>	<b>Polyester</b> (basic dyeable) Fastness, ISO daylight, 3, 3-4 persp., 5, 5 wash (3), 5, 5	<b>Polyester</b> (basic dyeable) Fastness, ISO daylight, 3, 3-4 persp., 5, 4-5 wash (3), 5, 5	Good levelling properties Not recommended for blends containing cellulosic fibres		Not dischargeable

60	61	62	63	64	C.I. Basic Red
Monoazo		Azo	Azo	Monoazo	CHEMICAL CLASS
—		—	—	—	C.I. CONSTITUTION NO.
ACRYLIC		ACRYLIC	ACRYLIC	ACRYLIC	SUBSTRATE
Bright Red		Red	Bluish Red (fluorescent)	Red	HUE
—		little yellower	yellower	yellower	Artificial Light (tungsten)
— — — — —		— — — — —	— — — — —	4-5 4 4 4 5	RESERVATION IN DYE BATH cotton viscose wool nylon (type) polyester
ISO daylight 6 6-7 7 alkaline 4-5 4-5 — — — — — — — ISO 3 4-5 5	This C.I. Generic Name is discontinued. Dyes formerly listed under it now appear under C.I. Basic Red 27	AATCC (Vonnell) Carbon arc 5 6 6-7 alkaline 5 5 severe 4 — 180°C/15 sec 4 — — III 5 —	AATCC (Vonnell) Carbon arc 4 5-6 4-5 alkaline 5 5 severe 4-5 — 180°C/15 sec 5 — — III 5 —	ISO daylight 6 6-7 7 alkaline 5 5 intermediate 5 — — — — — ISO 3 5 5	FASTNESS TEST METHODS Light source pale medium heavy Perspiration acid/alk. change staining Pleating conditions (steam) change staining Pressing conditions (dry) change after 2-4 hr staining Washing conditions change staining
Dischargeable in pale/medium depths with C.I. Reducing Agent 4				Dischargeable in pale/medium depths	NOTES ON APPLICATION AND USAGE

**C.I. Basic Red 65—71**

<b>C.I. Basic Red</b>	<b>65</b>	<b>66</b>	<b>67</b>	<b>68</b>	<b>69</b>
<b>CHEMICAL CLASS</b>	Monoazo	Methine	Monoazo	Methine (Cyanine)	Azo
<b>C.I. CONSTITUTION NO.</b>	—	—	—	—	—
<b>SUBSTRATE</b>	ACRYLIC	ACRYLIC	ACRYLIC	ACRYLIC	ACRYLIC
<b>HUE</b>	Bluish Red	Bright Bluish Red	Red	Red	Red
Artificial Light (tungsten)	yellower	yellower	yellower	little change	yellower
<b>RESERVATION IN DYEBATH</b>					
cotton	4	5	2	—	—
viscose	4	4	1-2	—	—
wool	—	3-4	2	—	—
nylon (type)	4	4-5 (6-6)	3	—	—
polyester	5	5	2	—	—
<b>FASTNESS</b>					
<b>TEST METHODS</b>	<b>AATCC</b>	<b>AATCC</b>	<b>AATCC</b>	<b>AATCC</b>	<b>AATCC</b>
<b>Light</b> source	Carbon arc	Carbon arc	Carbon arc	Carbon arc	Carbon arc
pale	5-6	4-5	7	5	—
medium	5-6	4-5	7	5-6	7-8
heavy	—	—	7-8	5-6	7-8
<b>Perspiration</b> acid/alk.	—	alkaline	acid alk.	alkaline	alkaline
change	—	5	5 5	4-5	5
staining	—	5	5 5	5	5
<b>Pleating</b> conditions	—	intermediate	—	—	—
(steam) change	—	3-4	4-5	—	—
staining	—	—	2-3	—	—
<b>Pressing</b> conditions	—	—	—	—	—
(dry) change	—	—	—	—	—
after 2-4 hr	—	—	—	—	—
staining	—	—	—	—	—
<b>Washing</b> conditions	III	III	III	III	III
change	5	5	5	5	5
staining	—	—	5	5	5
<b>NOTES ON APPLICATION AND USAGE</b>	Stable pH 3-6 Very good build-up  <b>Modacrylics</b> Suitable  <b>Polyester</b> (basic dyeable) Suitable	Stable pH 3-6 Build-up moderately good  <b>Modacrylics</b> Fastness, AATCC light (C. arc), 4-5 persp., 5 wash III, 5			



70	71		C.I. Basic Red
Azo	Monoazo		CHEMICAL CLASS
—	—		C.I. CONSTITUTION NO.
ACRYLIC	ACRYLIC		SUBSTRATE
Red	Reddish Violet		HUE
yellower	redder		Artificial Light (tungsten)
			RESERVATION IN DYEBATH cotton viscose wool nylon (type) polyester
AATCC	ISO		FASTNESS TEST METHODS
Carbon arc	daylight		Light source
—	6		pale
7-8	6-7		medium
7-8	7		heavy
alkaline	alkaline		Perspiration acid/alk.
5	5		change
5	5		staining
—	severe		Pleating conditions
—	4-5		(steam) change
—	—		staining
—	—		Pressing conditions
—	—		(dry) change
—	5		after 2-4 hr
—	—		staining
III	ISO 3		Washing conditions
5	5		change
5	5		staining
			NOTES ON APPLICATION AND USAGE



# C.I. Basic Violet 1—4

C.I. Basic Violet	1		2	3	4
CHEMICAL CLASS	Triarylmethane		Triarylmethane	Triarylmethane	Triarylmethane
C.I. CONSTITUTION NO.	42535		42520	42555	42600
SUBSTRATE	COTTON (tannin mordant)	WOOL	ACRYLIC	COTTON (tannin mordant)	COTTON (tannin mordant)
HUE	Bluish Violet	Bluish Violet	Reddish Violet	Bright Bluish Violet	Bluish Violet
Artificial Light (tungsten)	redder	—	yellow, duller	redder	much redder
RESERVATION IN DYE BATH					
cotton	—	—	2-3	—	—
viscose	—	—	2-3	—	—
wool	—	—	2-3	—	—
nylon (type)	—	—	3-4	—	—
polyester	—	—	5	—	—
FASTNESS					
TEST METHODS	B*	A*	C*	ISO AATCC	B* A* C* A*
Light	source	day.	daylight	Xe. arc C. arc	day. day.
pale	1	—	1	— 2-3	1 —
medium	1	1-2	1	3 3	1 1
heavy	1	—	1	— —	1 —
Perspiration	acid/alk.	—	—	alk. —	— —
change	1-2	4-5	—	4 —	1-2 1-2
staining	—	—	—	4-5 —	— —
Pleating (steam)	conditions	—	—	inter. —	— —
change	—	—	—	5 4-5	— —
staining	—	—	—	4-5 —	— —
Pressing (dry)	conditions	—	—	— —	— —
change	3	3	—	— —	3 3
after 2-4 hr	—	—	—	— —	— —
staining	—	—	—	— —	— —
Washing	conditions	—	—	ISO 3 —	— —
change	1-2	3-4	4	4-5 —	1-2 1-2
staining	—	—	4	5 —	— —
NOTES ON APPLICATION AND USAGE	<p>Dyeing also on bast fibres, silk</p> <p>Printing of cotton, silk, wool and dyeing on discharged tannin mordant (cotton)</p> <p><b>Major usage</b> of this dye is non-textile</p> <p><b>Pigments</b> with high mol. wt. acids <i>see</i> C.I. Pigment Violet 3</p> <p><b>Paper</b>—widely used</p> <p><b>Leather</b></p> <p><b>Distempers, Plastics</b></p> <p><b>Biological Stain, Indicator</b></p> <p><b>Photographic filters</b></p> <p><b>Spirit Inks, Lacquers</b></p> <p><b>Wood Stains</b></p> <p><b>Solvent dye</b>—free base used</p> <p><i>See</i> C.I. Solvent Violet 8</p>		<p>Slow dyeing</p> <p><b>Cotton</b> (tannin mordant)</p> <p>Fastness, C*</p> <p>light, 2</p> <p><b>Wool</b></p> <p>Fastness B*</p> <p>light, 1, 1, 2</p> <p><b>Silk</b></p> <p>Fastness C*</p> <p>light, 2</p> <p>washing, 4</p> <p><b>Paper</b></p> <p><b>Leather</b></p>	<p><b>Wool</b></p> <p>Fastness C*</p> <p>light, 1, 1, 2</p> <p>wash., 2-3, 1-2</p> <p><b>Silk</b></p> <p>Fastness C*</p> <p>light, 1, 2-3, 2</p> <p>washing, 3</p> <p><b>Paper</b>—widely used</p> <p><b>Leather</b></p> <p><b>Biological Stain Indicator</b></p> <p><b>Ball Pen Inks</b></p> <p><b>Carbon Paper</b></p> <p><b>Spirit Inks</b></p> <p><b>Lacquers</b></p> <p><i>See</i> C.I. Solvent Violet 9</p>	<p><b>Wool</b></p> <p>Fastness C*</p> <p>light, 1, 1, 1</p> <p>washing, 2, 1-2</p> <p><b>Silk</b></p> <p>Fastness C*</p> <p>light, 1, 2, 2</p> <p>washing, 2</p> <p><b>Pigments</b>—copper lake used as blue pigment</p> <p><b>Paper</b></p> <p><b>Leather</b></p> <p><b>Spirit Inks</b></p> <p><b>Carbon Paper</b></p> <p><b>Shoe Polishes</b></p> <p><b>Suede Dressing</b></p> <p><b>Biological Stain Indicator</b> (acid-base)</p>

**C.I. Basic Violet 5—13**

<b>C.I. Basic Violet</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>
<b>CHEMICAL CLASS</b>	Azine	Azine	Methine	Azine	—
<b>C.I. CONSTITUTION NO.</b>	50205	50055	48020	50210	—
<b>SUBSTRATE</b>	COTTON (tannin mordant)	COTTON (tannin mordant)	ACRYLIC	COTTON (tannin mordant)	COTTON (tannin mordant)
<b>HUE</b>	Bright Reddish Violet	Violet	Reddish Violet (fluorescent)	Reddish Violet	Reddish Violet
Artificial Light (tungsten)	yellow, brighter	—	yellow	—	—
<b>RESERVATION IN DYEBATH</b> cotton viscose wool nylon (type) polyester					
<b>FASTNESS</b>					
<b>TEST METHODS</b>	<b>A*</b>	<b>C*</b>	<b>ISO</b>	<b>B*</b>	
<b>Light</b> source	daylight	daylight	Xenon arc	daylight	
pale	—	—	4	1	
medium	2	1-2	4	1	
heavy	—	—	4	1	
<b>Perspiration</b> acid/alk.	—	—	alkaline	—	
change	2-3	—	4-5	1-2	
staining	—	—	3-4	—	
<b>Pleating</b> conditions	—	—	intermediate	—	
(steam) change	—	—	5	—	
staining	—	—	4-5	—	
<b>Pressing</b> conditions	—	—	—	—	
(dry) change	3	—	—	2-3	
after 2-4 hr	—	—	—	—	
staining	—	—	—	—	
<b>Washing</b> conditions	—	—	ISO 3	—	
change	2	2	4	1	
staining	—	—	4-5	—	
<b>NOTES ON APPLICATION AND USAGE</b>	<b>Silk</b> Fastness A* light, 2 persp., 2-3 hot press, 3 washing, 2-3  <b>Paper</b> <b>Leather</b> <b>Biological Stain</b> <b>Shoe Polishes</b> <b>Suede Dressings</b> <b>Wood Stains</b>	Gives clear tones  <b>Silk</b> Fastness C* light, 1-2 washing, 3 Gives clear tones	<b>Acetate</b> Apply by printing Fastness C* light, 3, 4, 4-5 washing, 4	<b>Silk</b> <b>Leather</b> <b>Paper</b>	Direct dyeing and printing Dyeing on dis- charged tannin mordant Used also for topping of indigo dyeings  <b>Bast fibres</b> <b>Silk</b> <b>Wool</b> <b>Paper</b>



10			11	12	13	C.I. Basic Violet	
Xanthene			Xanthene	Azine	Triarylmethane	CHEMICAL CLASS	
45170			45175	50235	42536	C.I. CONSTITUTION NO.	
SILK	COTTON (tannin mordant)		COTTON (tannin mordant)	COTTON (tannin mordant)	COTTON (tannin mordant)	SUBSTRATE	
Reddish Violet (fluorescent)	Bright Reddish Violet		Bright Reddish Violet	Bright Violet	Bluish Violet	HUE	
yellower	redder		—	—	—	Artificial Light (tungsten)	
<div>4</div> <div>2</div> <div>—</div> <div>4</div> <div>—</div>			<div>—</div> <div>—</div> <div>—</div> <div>—</div> <div>—</div>	<div>—</div> <div>—</div> <div>—</div> <div>—</div> <div>—</div>	<div>—</div> <div>—</div> <div>—</div> <div>—</div> <div>—</div>	RESERVATION IN DYEBATH cotton viscose wool nylon (type) polyester	
ISO	B*	A*	B*	C*	C*	FASTNESS TEST METHODS	
daylight	day.	day.	daylight	daylight	daylight	Light	source
2	1	—	1	1-2	—		pale
2	1	1	1	2	4-5		medium
2	2	—	2	2-3	—		heavy
alkaline	—	—	—	—	—	Perspiration	acid/alk.
3-4	1	1	1	—	—		change
1	—	—	—	—	—		staining
—	—	—	—	—	—	Pleating (steam)	conditions
—	—	—	—	—	—		change
—	—	—	—	—	—		staining
5	2-3	2-3	2-3	—	—	Pressing (dry)	conditions
—	—	—	—	—	—		change
—	—	—	—	—	—		after 2-4 hr
ISO 1	—	—	—	—	—		staining
3	1	1	1	2-3	2	Washing	conditions
3-4	—	—	—	—	—		change
<p><b>Cotton</b>—dyes on tannin, oil and synthetic mordants. Prints direct and as illuminating colour in discharges. Dyes on discharged tannin mordant</p> <p><b>Wool</b>—Fastness C* light, 2, 3, 3; washing, 3, 2-3</p> <p><b>Bast fibres</b> <b>Acetate, Nylon</b>—fluorescent effects <b>Paper</b>—widely used <b>Pigments</b>—with high mol. wt. acids gives brilliant red pigments. For printing inks, crayons, etc. Generally poor fastness except for C.I. Pigment Violet 1 <b>Distempers</b>—on china clay <b>Leather</b> <b>Spirit Inks and Lacquers</b> <b>Soap, Wood Stains, Feathers</b> <i>See C.I. Solvent Red 49</i></p>			<p>On tannin, oil or synthetic mordants On discharged tannin mordant Direct printing and as illuminating colour in discharges</p> <p><b>Wool</b> Fastness C* light, 2, 3, 3 washing, 3, 2-3</p> <p><b>Silk</b> Fastness C* light, 1, 2, 2 washing, 2-3 <b>Bast fibres</b> <b>Pigments</b>—<i>see C.I. Pigment Violet 2</i> <b>Leather</b> <b>Spirit Inks</b> <b>Wood Stains</b></p>	<p>Not dischargeable but unsuitable as illuminating colour in discharges</p> <p><b>Silk</b> <b>Wool</b></p>	<p>Dischargeable to white with chlorate or hypochlorite</p> <p><b>Silk</b> <b>Wool</b> <b>Pigments</b> <b>Hair dyes</b></p>	NOTES ON APPLICATION AND USAGE	

C.I. Basic Violet	14		15	16	17
CHEMICAL CLASS	Triarylmethane		Methine	Methine	Azine
C.I. CONSTITUTION NO.	42510		—	48013	—
SUBSTRATE	SILK	ACRYLIC	ACRYLIC	ACRYLIC	POLYESTER
HUE	Bright Reddish Violet	Bright Reddish Violet	Bright Reddish Violet	Reddish Violet (fluorescent)	Dull Violet
Artificial Light (tungsten)	yellower	yellower	yellower, brighter	yellower	redder
RESERVATION IN DYEBATH					
cotton	2	—	3-4	4-5	3-4
viscose	2	—	5	4-5	3-4
wool	2	—	3-4	3-4	2-3
nylon (type)	4	—	4	4	1-2
polyester	—	—	5	5	2-3
FASTNESS					
TEST METHODS	ISO	AATCC	AATCC	ISO AATCC	AATCC (Dacron 64)
Light source	daylight	—	Carbon arc	Xe. arc C. arc	Carbon arc
pale	1	—	4-5	— 3-4	4
medium	1	4-5	4-5	4 4	7-8
heavy	2	—	4-5	— 4	7-8
Perspiration acid/alk. change staining	alkaline 3-4 2	alkaline 5 —	alkaline 4-5 5	alk. 5 5	alkaline 4 5
Pleating (steam) conditions change staining	— — —	— — —	intermediate 3-4 5	inter. 5 4-5	intermediate 4 5
Pressing (dry) conditions change after 2-4 hr staining	— 5 — —	— — — —	160°C/15 sec 1 5 —	— — — —	160°C/60 sec 4-5 — 5
Washing conditions change staining	ISO 1 2 3-4	III 5 —	III 5 5	ISO 3 4-5 5	III 3 4-5
NOTES ON APPLICATION AND USAGE	<p><b>Cotton</b> (tannin mordant) Direct printing and dyeing on discharged tannin mordant Fastness: light (B*), 1, 1, 1; (A*), 1 washing (A*), 2</p> <p><b>Wool</b> Fastness C*: light, 1, 1, 2; washing, 2-4, 5</p> <p><b>Bast fibres</b> <b>Paper</b>—widely used <b>Pigments</b>—with high mol. wt. acids are red to bordeaux pigments. For printing inks, crayons etc. Generally poor fastness except for C.I. Pigment Violet 4 <b>Distempers</b>—on china clay <b>Leather</b> <b>Photography</b>—filter dye <b>Spirit Inks</b> etc Free base—C.I. Solvent Red 41</p>		<p>Stable pH 3-10 Rapid dyeing</p> <p><b>Modacrylics</b> Fastness AATCC light (C. arc), 2-3</p> <p><b>Acetate</b> (print) Fastness AATCC light (C. arc), 4 persp., 2-3, 4 wash II, 5, 5</p> <p><b>PVC fibres</b>—dye as complex with anionic surfactant Fastness AATCC light (C. arc), 4-5</p>	<p>Rapid dyeing</p> <p><b>Modacrylics</b> <b>Acetate</b> <b>Nylon</b></p>	<p>Dyeings on this basic dyeable polyester are made with addition of a suitable carrier at the boil or at high temperature under pressure Stable pH 3-5 Moderate dyeing rate; excellent build-up</p> <p><b>Acrylics</b> Fastness AATCC light (C. arc), 6-7</p> <p><b>Modacrylics</b> Fastness AATCC light (C. arc) 3-4</p>

18	19	20	21	22	C.I. Basic Violet
Monoazo	Monoazo	Polymethine	Polymethine	—	CHEMICAL CLASS
—	—	—	—	—	C.I. CONSTITUTION NO.
ACRYLIC	ACRYLIC	ACRYLIC	ACRYLIC	ACRYLIC	SUBSTRATE
Bright Reddish Violet	Reddish Violet	Bright Reddish Violet	Bright Bluish Violet	Bright Violet	HUE
redder	little yellower	yellower	redder	redder, brighter	Artificial Light (tungsten)
5 5 5 — 5	4-5 4-5 3 3 3	5 5 5 5 5	3-4 3-4 5 5 5	4 5 4 2-3 (6-6) 3-4	RESERVATION IN DYE BATH cotton viscose wool nylon (type) polyester
AATCC	ISO (Courtelle) Xenon arc	ISO (Courtelle) Xenon arc	ISO (Courtelle) Xenon arc	ISO day. Xe. arc	FASTNESS TEST METHODS
— 6 6-7 —	6 6 6-7	4-5 5 5	5 5-6 5-6	6-7 6 7 6 7-8 6-7	Light source pale medium heavy
— 4-5 —	alkaline 5 5	alkaline 5 5	alkaline 5 5	alkaline 4-5 5	Perspiration acid/alk. change staining
— — —	intermediate 5 4-5	intermediate 5 4-5	intermediate 4 4-5	intermediate 4 4-5	Pleating (steam) conditions change staining
— — — —	— 5 — 5	— 3-4 — —	— 4 — —	— 2-3 4 —	Pressing (dry) conditions change after 2-4 hr staining
III A 4-5 5	ISO 3 5 5	ISO 3 5 5	ISO 3 5 5	ISO 3 4-5 5	Washing conditions change staining
Not dischargeable	Dischargeable Silk (print) Fastness ISO light, 3-4, 4, 5 persp., 4, 2 wash (1), 3-4, 3  Acetate Printing	Dischargeable with C.I. Reducing Agent 4 Suitable as illum- inating colour in discharges with stannous salts  Acetate (print) Fastness ISO light, 4-5, 5, 6 persp., 4-5, 2-3 wash (1), 3-4, 4-5  Silk (print) Fastness ISO light, 1, 2, 3 persp., 3-4, 3 wash (1), 4, 3-4	Dischargeable with C.I. Reducing Agent 4 Suitable as illum- inating colour in discharges with stannous salts		NOTES ON APPLICATION AND USAGE

**C.I. Basic Violet 23—32**

<b>C.I. Basic Violet</b>	<b>23</b>	<b>24</b>	<b>25</b>	<b>26</b>	<b>27</b>
<b>CHEMICAL CLASS</b>	Triarylmethane	Anthraquinone	Anthraquinone	Azo	Methine
<b>C.I. CONSTITUTION NO.</b>	42557	—	—	—	—
<b>SUBSTRATE</b>		ACRYLIC	ACRYLIC	ACRYLIC	ACRYLIC
<b>HUE</b>		Bluish Violet	Bluish Violet	Bluish Violet	Reddish Violet (fluorescent)
Artificial Light (tungsten)		much redder	much redder	redder, duller	yellower
<b>RESERVATION IN DYE BATH</b> cotton viscose wool nylon (type) polyester		3 3-4 3-4 3 3	— 5 5 — —	— — — — —	— 5 5 — —
<b>FASTNESS</b> TEST METHODS		AATCCC	AATCC	AATCC	AATCC
Light source pale medium heavy		Carbon arc 6 6 6	Carbon arc 6 6-7 7	Carbon arc 5 5-6 5-6	Carbon arc 4-5 4-5 5
Perspiration acid/alk. change staining	Very similar in usage and prop- ties to C.I. Basic Violet 3	alkaline 4-5 5	alkaline 5 5	alkaline 4-5 4-5	alkaline 5 5
Pleating (steam) conditions change staining		intermediate 4-5 4-5	severe 4-5 5	severe 3-4 —	intermediate 5 —
Pressing (dry) conditions change after 2-4 hr staining		160°C/60 sec 4-5 — 5	160°C/15 sec 4-5 4-5 —	180°C/15 sec 3-4 — —	160°C/15 sec 1 5 —
Washing conditions change staining		III 4-5 5	III 5 5	III 5 5	III 5 5
<b>NOTES ON APPLICATION AND USAGE</b>		Stable pH 2-7 and up to 120°C Moderate dyeing rate	Stable pH 3-5 Rapid dyeing Not dischargeable Suitable for illum- inated discharges  <b>Acetate (print)</b> Fastness AATCC light (C. arc), 5 persp., 5, 5 wash II, 5, 5	Dischargeable	Stable pH 3-5 Moderate dyeing rate Dischargeable with C.I. Reducing Agent 1 Suitable as illum- inating colour in discharges with stannous salts  <b>Acetate (print)</b> Fastness AATCC light (C. arc), 4 persp., 4-5, 3 wash II, 4-5, 5  <b>PVC fibres</b>



28	29	30	31	32	C.I. Basic Violet
Azo	Monoazo	Azo	Azo	Azo	CHEMICAL CLASS
—	—	—	—	—	C.I. CONSTITUTION NO.
ACRYLIC	ACRYLIC	ACRYLIC	ACRYLIC	ACRYLIC	SUBSTRATE
Reddish Blue	Reddish Violet	Reddish Violet	Violet	Bluish Violet	HUE
greener, duller	redder	little yellower	redder	much redder	Artificial Light (tungsten)
— 4-5 4-5 — —	4 3 5 4 5	3 3 4 3-4 (6.6) 3-4	3 2-3 3 3 (6.6) 3	4 3-4 2-3 1 4-5	RESERVATION IN DYEBATH cotton viscose wool nylon (type) polyester
AATCC	ISO	ISO AATCC	ISO AATCC	ISO	FASTNESS TEST METHODS
Carbon arc 5-6 6 6	day. Xe. arc 5-6 5 6 5-6 6-7 6	day. C. arc 6-7 5-6 6-7 6 7 7	day. C. arc 3-4 3 5 4-5 6-7 5-6	daylight 5-6 6 6-7	Light source pale medium heavy
alkaline 5 5	alkaline 4-5 5	alk. 5 5	alk. 5 5	alkaline 4-5 5	Perspiration acid/alk. change staining
intermediate 4-5 —	intermediate 4 —	severe 5 5	severe 5 5	intermediate 5 5	Pleating (steam) conditions change staining
160°C/15 sec 3 4 —	115°C/15 sec 5 — —	140°C/15" 4-5 —	140°C/15" 5 — —	— — —	Pressing (dry) conditions change after 2-4 hr staining
III 5 5	ISO 3 4-5 5	ISO 1 5 5	ISO 1 III 5 5 5 5	ISO 3 5 5	Washing conditions change staining
Stable pH 2-4.5 Moderate dyeing rate Dischargeable with C.I. Reducing Agent 1				Polyester (basic dyeable) (Dacron 92) Fastness ISO light (Xe.), 3, 4 persp., 5, 4 wash (3), 5, 4	NOTES ON APPLICATION AND USAGE

**C.I. Basic Violet 33—41**

<b>C.I. Basic Violet</b>	<b>33</b>	<b>34</b>	<b>35</b>	<b>36</b>	<b>37</b>
<b>CHEMICAL CLASS</b>	Monoazo	Azo	Azo	Azo	Monoazo
<b>C.I. CONSTITUTION NO.</b>	—	—	—	—	—
<b>SUBSTRATE</b>	ACRYLIC	ACRYLIC	ACRYLIC	ACRYLIC	ACRYLIC
<b>HUE</b>	Reddish Violet	Reddish Violet	Reddish Violet	Reddish Violet	Violet
Artificial Light (tungsten)	yellow, brighter	yellow	much redder	redder	redder
<b>RESERVATION IN DYE BATH</b>					
cotton	5	4	4	—	—
viscose	4	5	5	—	—
wool	4-5	4	4	—	—
nylon (type)	3-4	3-4 (6-6)	3 (6-6)	—	—
polyester	4-5	5	5	—	—
<b>FASTNESS</b>					
<b>TEST METHODS</b>	<b>ISO</b>	<b>ISO</b>	<b>ISO</b>	<b>AATCC</b>	<b>ISO</b>
<b>Light</b> source	day. Xe. arc	day. Xe. arc	day. Xe. arc	Carbon arc	daylight
pale	5-6 6	4-5 4-5	5 5	5-6	6
medium	6 6	5-6 5-6	6 6	6	7
heavy	6-7 6-7	6 6	6-7 6-7	6-7	—
<b>Perspiration</b> acid/alk.	alkaline	alkaline	alkaline	alkaline	alkaline
change	5	4-5	4-5	5	5
staining	5	4-5	4-5	5	5
<b>Pleating</b> conditions	intermediate	intermediate	intermediate	severe	intermediate
(steam) change	4-5	4-5	4-5	4-5	5
staining	5	4-5	4	—	4-5
<b>Pressing</b> conditions	160°C/30 sec	—	—	180°C/15 sec	—
(dry) change	5	3	2	4-5	—
after 2-4 hr	—	4-5	4-5	—	—
staining	5	—	—	—	—
<b>Washing</b> conditions	ISO 3	ISO 3	ISO 3	III	ISO 3
change	5	4-5	4-5	5	5
staining	—	4-5	4-5	—	5
<b>NOTES ON APPLICATION AND USAGE</b>	<p>Stable up to pH 7.0 and up to 130°C  Very rapid rate of dyeing  Good levelling</p> <p><b>Modacrylics</b>  Fastness ISO daylight, 5-6</p> <p><b>Polyester</b> (basic dyeable)  (Dacron 62)  Fastness ISO daylight, 4, 5</p>				

38	39	40	41		C.I. Basic Violet
Monoazo	Methine (Cyanine)	Methine	Monoazo		CHEMICAL CLASS
—	—	—	—		C.I. CONSTITUTION NO.
ACRYLIC	ACRYLIC	ACRYLIC	ACRYLIC		SUBSTRATE
Reddish Violet	Violet	Reddish Violet	Reddish Violet		HUE
redder	redder	redder	little yellower		Artificial Light (tungsten)
			1 2 2-3 2 2-3		RESERVATION IN DYEBATH cotton viscose wool nylon (type) polyester
ISO	AATCC	AATCC	AATCC		FASTNESS TEST METHODS
daylight	Carbon arc	Carbon arc	Carbon arc	Light	source
6	5	—	7-8		pale
7	4	4-5	8		medium
—	4	4-5	8		heavy
alkaline	alkaline	alkaline	alkaline	Perspiration	acid/alk. change staining
5	5	5	4		
5	—	5	5		
intermediate	—	—	intermediate	Pleating (steam)	conditions change staining
5	—	—	4-5		
5	—	—	2-3		
—	—	—	—	Pressing (dry)	conditions change after 2-4 hr staining
—	—	—	—		
—	—	—	—		
—	—	—	—		
ISO3	III	III	III	Washing	conditions change staining
5	4-5	5	5		
5	5	5	5		
					NOTES ON APPLICATION AND USAGE





# C.I. Basic Blue 1—4

C.I. Basic Blue	1		2	3	4
CHEMICAL CLASS	Triarylmethane		Triarylmethane	Oxazine	
C.I. CONSTITUTION NO.	42025		42025 (similar to)	51004	
SUBSTRATE	ACRYLIC	COTTON (tannin mordant)		ACRYLIC	
HUE	Bright Greenish Blue	Bright Greenish Blue		Bright Greenish Blue	
Artificial Light (tungsten)	greener	greener		much greener	
RESERVATION IN DYEBATH					
cotton	3-4	—		4	
viscose	3-4	—		4	
wool	3	—		3	
nylon (type)	4	—		4	
polyester	5	—		4-5	
FASTNESS					
TEST METHODS	ISO	AATCC	C*	A*	
Light source	Xe. arc	C. arc	day.	—	
pale	3-4	2-3	1	—	
medium	4	3	1	—	
heavy	4-5	3	2	—	
Perspiration acid/alk. change staining	alk. 4-5 3	alk. 5 —	— —	— 1-2 —	
Pleating (steam) conditions change staining	inter. 5 4	— —	— —	— —	
Pressing (dry) conditions change after 2-4 hr staining	— — —	— — —	— — —	3 — —	
Washing conditions change staining	ISO 3 4-5 4	III 5 —	— 3 —	— 1 —	
Very similar in usage and properties to C.I. Basic Blue 1					
ISO	AATCC	C*	A*		
day.	C. arc	day.	—		
4-5	4-5	4-5	—		
5	4-5	4-5	—		
6	—	—	—		
alk.	alk.	alk.	—		
4-5	4-5	4-5	—		
4-5	5	5	—		
inter.	inter.	inter.	—		
4-5	4	4	—		
4	5	5	—		
—	—	—	—		
4	—	—	—		
5	—	—	—		
4-5	—	—	—		
ISO 3	III	ISO 3	III		
4-5	5	4-5	4-5		
4-5	5	4-5	5		
NOTES ON APPLICATION AND USAGE	<p>Not dischargeable, but unsuitable for coloured discharges</p> <p><b>Cotton</b>—dyeing on tannin mordant and discharged tannin mordant. Printing</p> <p><b>Silk</b>—Fastness C* light, 1; washing, 1-2</p> <p><b>Wool</b>—Fastness C* light, 1, 1, 2; washing, 3, 5</p> <p><b>Acetate (print)</b>—Fastness C* light, 5, 5-6, 5-6; washing, 4-5</p> <p><b>Bast fibres</b></p> <p><b>Paper</b></p> <p><b>Leather</b></p> <p><b>Solvent dye</b>—base is used</p> <p><b>Distempers</b>—on china clay</p> <p><b>Pigments</b>—with high mol. wt. acids</p> <p>See C.I. Pigment Blue 9</p>			<p>Good pH stability even under alkaline conditions</p> <p>Good levelling</p> <p>Stable at 130°C</p> <p>Not dischargeable</p> <p><b>Modacrylics</b></p> <p>Fastness AATCC, light, 3, 3</p> <p><b>Polyester</b> (basic dyeable)</p> <p>Fastness ISO light, 3, 3</p> <p><b>Cotton</b> (tannin mordant)</p> <p>Fastness C* light, 2, 2, 3</p> <p>washing, 2</p> <p><b>Solvent dye</b></p> <p><b>Leather</b></p>	

This C.I. Generic Name is discontinued. Dyes formerly listed under it now appear under C.I. Basic Blue 3

C.I. Basic Blue	5					6		7		8	
CHEMICAL CLASS	Triarylmethane					Oxazine		Triarylmethane		Triarylmethane	
C.I. CONSTITUTION NO.	42140					51175		42595		42563	
SUBSTRATE	ACRYLIC		WOOL			COTTON (tannin mordant)		SILK		SILK	
HUE	Bright Blue		Bright Blue			Reddish Navy		Bright Blue		Reddish Blue	
Artificial Light (tungsten)	greener, duller		greener			redder		greener, duller		much redder	
RESERVATION IN DYEBATH											
cotton	2-3		—			—		2		—	
viscose	2-3		—			—		2		—	
wool	1		—			—		2		—	
nylon (type)	3		—			—		4		—	
polyester	4-5		—			—		2		—	
FASTNESS TEST METHODS	ISO	AATCC	C*	A*	C*	A*	ISO	A*	C*	A*	
Light	source	Xe. arc	C. arc	day.	day.	day.	day.	day.	day.	day.	
	pale	3-4	4	1	—	1	—	1	—	1	
	medium	4	4	1	1-2	1	2	1	1	1	
	heavy	4-5	4	2	—	2	—	2	—	—	
Perspiration	acid/alk. change staining	alk. 4-5 3	alk. 5 —	— — —	— 2-3 —	— — —	— 3 —	alk. 5 3-4	— 5 2	— — —	
Pleating (steam)	conditions change staining	inter. 5 4-5	— — —	— — —	— 3 —	— — —	— — —	— — —	— — —	— — —	
Pressing (dry)	conditions change after 2-4 hr staining	— — — —	— — — —	— — — —	— — — —	— 3 — —	— 3 — —	— 5 — —	— — — —	— — — —	
Washing	conditions change staining	ISO 3 4-5 4-5	III 4 —	— 3-4 4-5	— 2-3 —	— 1-2 4-5	— 3 —	ISO 1 3-4 5	— 1 3	— 3 —	
NOTES ON APPLICATION AND USAGE	Not dischargeable  Wool—dyeings are chrome resistant Cotton (tannin mordant)—direct dyeing and printing. Dyeing on discharged tannin-antimony mordant Fastness C*: light, 1, 1, 2; washing, 3-4  Acetate (print)—Fastness C* light, 5, 5-6, 5-6; washing, 4-5  Silk—Fastness C* light, 2; washing, 1-2  Best fibres Solvent dye—base is used in printing inks, lacquers, varnishes, etc. Pigments—with high mol. wt. acids See C.I. Pigment Blues 3 and 8 Paper Leather					Not dischargeable Direct dyeing and printing As illuminating colour in discharges Dyeing on discharged tannin mordant  Wool Fastness C* light, 1, 1, 1-2 washing, 1-2  Silk Fastness C* light, 1, 1, 1-2 washing, 1-2  Acrylic fibres Jute Leather Paper Biological Stain		Best fibres  Wool Fastness C* light, 1, 1, 1 washing, 2, 2  Cotton Fastness C* light, 1, 1, 1-2 washing, 1, 3  Solvent dye— base is C.I. Solvent Blue 5 Wood Stains Carbon Papers Distempers Paper Leather Pigments—with high mol. wt. acids See C.I. Pigment Blue 1		Cotton (tannin mordant) Fastness C* light, 1, 1, 1 washing, 2  Wool Fastness C* light, 1, 1, 1-2 washing, 2-3, 2  Best fibres Paper Pigments Leather Carbon Paper Distempers Wood Stains Shoe Polishes Suede Dressings Solvent dye— base is C.I. Solvent Blue 2  Biological stain	

9		10	11	12	C.I. Basic Blue
Thiazine		Oxazine	Triarylmethane	Oxazine	CHEMICAL CLASS
52015		51190	44040	51180	C.I. CONSTITUTION NO.
SILK	COTTON (tannin mordant)	COTTON (tannin mordant)	COTTON (tannin mordant)	COTTON (tannin mordant)	SUBSTRATE
Greenish Blue	Bright Greenish Blue	Navy	Bright Reddish Blue	Bright Blue	HUE
greener, duller	greener	—	greener, duller	much greener	Artificial Light (tungsten)
2	—	—	—	—	RESERVATION IN DYE BATH cotton viscose wool nylon (type) polyester
1-2	—	—	—	—	
2	—	—	—	—	
5	—	—	—	—	
—	—	—	—	—	
ISO	C*    A*	C*	C*	A*	FASTNESS TEST METHODS
daylight	day.    day.	daylight	daylight	daylight	Light    source
1	2	2	1	—	pale
1	3	3	1	1	medium
2	4	3	2	—	heavy
alkaline	—	—	—	—	Perspiration    acid/alk.
2	1-2	1-2	—	2-3	change
1	—	—	—	—	staining
—	—	—	—	—	Pleating    conditions
—	—	—	—	—	(steam)    change
—	—	—	—	—	staining
—	—	—	—	—	Pressing    conditions
5	—	3	—	3	(dry)    change
—	—	—	—	—	after 2-4 hr
—	—	—	—	—	staining
ISO 1	—	—	—	—	Washing    conditions
1	2-3	1-2	3	1	change
2	4-5	—	2	—	staining
Withstands reduction discharge Suitable illuminated discharges			Direct dyeing and printing; on dis- charged tannin mordant	Silk (printing) Fastness A* light, 1-2 perspiration, 3 washing, 3	NOTES ON APPLICATION AND USAGE
Cotton—direct application and dyeing on discharged tannin mordant			Silk Fastness C* light 1, 1-2, 2 washing 3	Wool Leather Wood Stains Suede Dressings Shoe Polishes Indicator (acid- base)	
Bast fibres, Viscose			Wool		
Wool—Fastness C*: light, 1, 1, 1-2			Fastness C* light, 1, 1, 2 washing, 3-4, 4-5		
Paper—good light fastness			Bast fibres		
Pigments—with high mol. wt. acids			Pigments		
Leather—tends to bronze and mark off			See C.I. Pigment		
Medicinal			Blues 10 and 11		
External Drugs and Cosmetics			Paper		
Biological Stain			Leather		
Distempers			Carbon Paper		
Wood Stain			Wood Stains		
Solvent dye—free base is C.I. Solvent			Solvent dye—		
Blue 8			base is C.I. Solvent		
			Blue 6		
			Biological Stain		

**C.I. Basic Blue 13—22**

<b>C.I. Basic Blue</b>	<b>13</b>	<b>14</b>	<b>15</b>	<b>16</b>	<b>17</b>
<b>CHEMICAL CLASS</b>	Azine	Azine	Triarylmethane	Monoazo	Thiazine
<b>C.I. CONSTITUTION NO.</b>	50306	50305	44085	12210	52040
<b>SUBSTRATE</b>	COTTON (tannin mordant)		COTTON (tannin mordant)	SILK	COTTON (tannin mordant)
<b>HUE</b>	Navy		Blue	Reddish Navy	Bright Reddish Blue
Artificial Light (tungsten)	—		—	—	—
<b>RESERVATION IN DYEBATH</b> cotton viscose wool nylon (type) polyester					
<b>FASTNESS</b> TEST METHODS	<b>C*</b>	Very similar in usage and prop- erties to C.I. Basic Blue 13	<b>C*</b>	<b>C*</b>	<b>C*</b>
Light	daylight		daylight	daylight	daylight
source	—		1	—	2
pale	—		1	3	2-3
medium	1-2		1-2	—	3
heavy	—		—	—	—
Perspiration	—		—	—	—
acid/alk.	—		—	—	—
change	—		—	—	—
staining	—		—	—	—
Pleating (steam)	—		—	—	—
conditions	—		—	—	—
change	—		—	—	—
staining	—		—	—	—
Pressing (dry)	—		—	—	—
conditions	—		—	—	—
change	—		—	—	—
after 2-4 hr	—		—	—	—
staining	—		—	—	—
Washing	—		—	—	—
conditions	—		—	—	—
change	2		1	5	1-2
staining	—		—	—	—
<b>NOTES ON APPLICATION AND USAGE</b>	For dyeing and printing		<b>Wool</b> Fastness C* light, 1, 1-2, 1-2 washing 2, 1-2  <b>Silk</b> Fastness C* light 1, 1-2, 1-2 washing, 2-3  <b>Bast fibres</b> <b>Leather</b>	Dischargeable to white  <b>Cotton</b> (tannin mordant) Fastness C* light, 5  <b>Leather</b> <b>Paper</b>	Direct dyeing and printing Also in coloured discharge printing  <b>Silk</b> <b>Wool</b>



18	19	20	21	22	C.I. Basic Blue
Triarylmethane		Triarylmethane	Anthraquinone	Anthraquinone	CHEMICAL CLASS
42705		42585	—	—	C.I. CONSTITUTION NO.
COTTON (tannin mordant)		COTTON (tannin mordant)	ACRYLIC	ACRYLIC	SUBSTRATE
Bright Blue		Greenish Blue	Reddish Blue	Bright Blue	HUE
—		—	redder	little redder	Artificial Light (tungsten)
— — — — —		— — — — —	4 4-5 3-4 3 3-4	3-4 2-3 4 3 3	RESERVATION IN DYE BATH cotton viscose wool nylon (type) polyester
C* daylight 1 1 2  — — —  — — —  — — 2 —	This C.I. Generic Name is discontinued. Dyes formerly listed under it now appear under C.I. Basic Blue 1	C* daylight 1 1 1-2  — — —  — — —  — — 2 —	ISO    AATCC day.    C. arc 6        6-7 7        6-7 7        —  alk.     alk. 5        5 5        5  inter.    inter. 5        5 5        5  —        160°C/60" —        5 —        — —        —  ISO 3    III 5        5 5        5	ISO    AATCC day.    C. arc 6        5-6 6-7      6-7 6-7      —  alk.     alk. 5        5 5        5  inter.    inter. 4-5      4 4-5      5  —        160°C/60" 4        4-5 5        — 5        —  ISO 3    III 5        5 5        5	FASTNESS TEST METHODS  Light        source pale medium heavy  Perspiration    acid/alk. change staining  Pleating (steam)        conditions change staining  Pressing (dry)          conditions change after 2-4 hr staining  Washing        conditions change staining
Direct dyeing and on a discharged tannin mordant Not dischargeable  <b>Silk</b> Fastness C* light, 1, 2, 3 washing, 3-4  <b>Distempers</b> —on china clay		Direct dyeing and printing Also as illuminat- ing colour in dis- charges Also for dyeing on discharged tannin mordant  <b>Silk</b> Fastness C* light, 1-2, 2, 2 washing, 2-3  <b>Wool</b> Fastness C* light, 1, 1, 1 washing, 1, 1  <b>Jute</b> <b>Leather</b>	Stable pH 2-8 Moderate dyeing rate  <b>Modacrylics</b> Fastness AATCC light (C. arc), 3-4  <b>Polyester</b> (basic dyeable)	Stable pH 3-8 Slow dyeing  <b>Modacrylics</b> Fastness AATCC light (C. arc), 3	NOTES ON APPLICATION AND USAGE

C.I. Basic Blue	23	24	25	26	27-32
<b>CHEMICAL CLASS</b>	Triarylmethane	Thiazine	Thiazine	Triarylmethane	
<b>C.I. CONSTITUTION NO.</b>	<i>see notes†</i>	52030	52025	44045	
<b>SUBSTRATE</b>	SILK	COTTON (tannin mordant)	COTTON (tannin mordant)	COTTON (tannin mordant)	
<b>HUE</b>	Bright Blue	Bright Blue	Dull Greenish Blue	Bright Blue	
Artificial Light (tungsten)	—	—	—	greener, duller	
<b>RESERVATION IN DYEBATH</b> cotton viscose wool nylon (type) polyester					
<b>FASTNESS</b> TEST METHODS	C*	C*	C*	C*	These C.I. Generic Names are discontinued
Light source	daylight	daylight	daylight	daylight	
pale	—	2	2	1	
medium	2	3	2-3	1	
heavy	—	4	3-4	1	
Perspiration acid/alk. change	—	—	—	—	
staining	3	—	1-2	—	
Pleating (steam) conditions change	—	—	—	—	
staining	—	—	—	—	
Pressing (dry) conditions change	—	—	—	—	
after 2-4 hr	—	—	3	—	
staining	—	—	—	—	
Washing conditions change	—	—	—	—	
staining	1-2	4-5	2	3	
	—	—	4-5	—	
<b>NOTES ON APPLICATION AND USAGE</b>		Withstands reduction discharge Used as illuminating colour in discharges Direct dyeing and dyeing on discharged tannin mordant  Silk Wool Bast fibres Paper Leather	Direct dyeing and printing Also as illuminating colour in discharges and dyeing on discharged tannin mordant  Silk Fastness C* light, 1-2 washing, 1  Wool Bast fibres Paper Distempers	Direct printing Dyeing on discharged tannin mordant  Wool Fastness C* light, 1, 1-2, 2 washing, 3 Fast to stoving  Silk Fastness C* light, 1, 1-2, 2 washing 3 Jute Paper—widely used Pigments— <i>see</i> C.I. Pigment Blue 2 Leather Biological Stain Solvent dye— base is C.I. Solvent Blue 4	
	†This dye is similar in constitution to C.I. 42140 (C.I. Basic Blue 5) but contains a sulphonic acid group				

33	34	35	36	37	C.I. Basic Blue
Phthalocyanine		Anthraquinone	Triarylmethane	Azine	CHEMICAL CLASS
—		—	—	—	C.I. CONSTITUTION NO.
PAPER		ACRYLIC	ACRYLIC	POLYESTER (basic dyeable)	SUBSTRATE
Bright Greenish Blue		Blue	Bright Greenish Blue	Greenish Navy	HUE
greener, duller		greener	greener, duller	greener, duller	Artificial Light (tungsten)
— — — — —	This C.I. Generic Name is discontinued	3-4 4 2-3 2-3 2-3	— — — — —	— — — — —	RESERVATION IN DYEBATH cotton viscose wool nylon (type) polyester
ISO daylight 4 5 5  — — —  — — —  — — —  — — —		AATCC (Orlon 42) Carbon arc 7-8 8 —  alkaline 4-5 5  intermediate 4-5 5  160°C/60 sec 4 — —  III 4-5 5	AATCC Carbon arc 3 2-3 —  alkaline 5 —  intermediate 4-5 —  — — —  — — —	AATCC Carbon arc — 5-6 —  alkaline 3 —  — — —  — — —  III A 4 —	FASTNESS TEST METHODS  Light source pale medium heavy  Perspiration acid/alk. change staining  Pleating conditions (steam) change staining  Pressing conditions (dry) change after 2-4 hr staining  Washing conditions change staining
For colouration of paper either by surface dyeing or in the beater Gives bright colours of high light fastness  Bast fibres		Stable pH 2-6 Moderate to slow dyeing rate  Modacrylics Fastness AATCC light (C.arc), 4-6  Polyester (basic dyeable) Suitable	Slow dyeing	Stable pH 3-5 Moderate dyeing rate  Acrylic fibres	NOTES ON APPLICATION AND USAGE

**C.I. Basic Blue 38—47**

C.I. Basic Blue	38	39	40	41	42
<b>CHEMICAL CLASS</b>	Monoazo		Monoazo	Monoazo	Monoazo
<b>C.I. CONSTITUTION NO.</b>	—		—	—	—
<b>SUBSTRATE</b>	ACRYLIC		ACRYLIC	ACRYLIC	ACRYLIC
<b>HUE</b>	Bright Reddish Blue		Bright Blue	Bright Blue	Bright Blue
Artificial Light (tungsten)	little redder		redder, duller	redder, duller	greener, duller
<b>RESERVATION IN DYE BATH</b>					
cotton	4		4-5	3	4
viscose	4		4-5	3	4
wool	5		4	3	4
nylon (type)	4		4	3	3
polyester	—		4	3-4	3-4
<b>FASTNESS</b>					
TEST METHODS	AATCC		ISO (Orlon 42)	ISO (Orlon 42)	ISO (Orlon 42)
Light	source	This C.I. Generic Name is discontinued	day. Xe. arc	day. Xe. arc	day. Xe. arc
	pale		6-7 5-6	6 6	6-7 6
	medium		7 6	7 6-7	7 6-7
	heavy		7 6	7 7	7 7
Perspiration	acid/alk.		alkaline	alkaline	alkaline
	change		5	4-5	5
	staining		5	4-5	5
Pleating	conditions		intermediate	intermediate	intermediate
(steam)	change		3	4	3-4
	staining		4-5	4-5	4-5
Pressing	conditions		160°C/30sec	—	160°C/30sec
(dry)	change		5	4	5
	after 2-4 hr		5	5	5
	staining		5	—	5
Washing	conditions		ISO 3	ISO 3	ISO 3
	change		5	4-5	5
	staining		5	4-5	5
<b>NOTES ON APPLICATION AND USAGE</b>	Not dischargeable		Stable up to pH 5 Rapid dyeing Not recommended for high temperature dyeing or for post dyeing, decatizing or pressure steam pleating  <b>Modacrylics</b> Not recommended  <b>Polyester</b> (basic dyeable) Not recommended	Stable up to pH 5.5 and up to 130°C Rapid dyeing Not recommended for post dyeing, decatizing or pressure steam pleating  <b>Modacrylics</b> Fastness ISO daylight, 6, 6  <b>Polyester</b> (basic dyeable) (Dacron 62) Fastness ISO daylight, 5, 6	Stable up to pH 5 Rapid dyeing Not recommended for high temperature dyeing or for post dyeing, decatizing or pressure steam pleating  <b>Modacrylics</b> Not recommended  <b>Polyester</b> (basic dyeable) Not recommended



43	44	45	46	47	C.I. Basic Blue
		Anthraquinone	Anthraquinone	Anthraquinone	CHEMICAL CLASS
		—	—	—	C.I. CONSTITUTION NO.
		ACRYLIC	ACRYLIC	ACRYLIC	SUBSTRATE
		Greenish Blue	Reddish Blue	Reddish Blue	HUE
		greener, duller	greener, duller	redder, duller	Artificial Light (tungsten)
This C.I. Generic Name is discontinued	This C.I. Generic Name is discontinued. Dyes formerly listed under it now appear under C.I. Basic Blue 22	— 5 4 — 2	3-4 3-4 2 2 2	— 4-5 4 — 2	RESERVATION IN DYEBATH cotton viscose wool nylon (type) polyester
		ISO    AATCC Xe.arc    C.arc 6-7    6-7 6-7    7 6-7    7-8  alk.    alk. 5    5 5    5  inter.    severe 5    5 5    5  —    160°C/15" —    4 —    5 —    —  ISO 3    III 5    5 5    5	ISO (Courtelle) Xenon arc 6-7 6-7 7  alkaline 5 5  intermediate 5 5  — — — —  ISO 3 5 5	ISO    AATCC Xe.arc    C.arc 6-7    7 6-7    7 7    7-8  alk.    alk. 5    5 5    5  inter.    severe 5    4-5 4-5    4-5  —    — —    — —    — —    —  ISO 3    III 5    5 5    5	FASTNESS TEST METHODS  Light    source pale medium heavy  Perspiration    acid/alk. change staining  Pleating (steam)    conditions change staining  Pressing (dry)    conditions change after 2-4 hr staining  Washing    conditions change staining
		Stable pH 3-6 Rapid dyeing Not dischargeable Suitable for illuminated discharges  Acetate (print) Fastness AATCC light (C.arc), 5-6 persp., 4, 5 wash II, 5, 5		Stable pH 3-5 Moderate dyeing rate Suitable for illuminated discharges with stannous chloride  Acetate (print) Fastness AATCC light (C.arc), 5-6 persp., 4, 4-5 wash II, 5, 5  Silk (print) Fastness ISO light, 4, 5, 5 wash (1), 3-4, 4	NOTES ON APPLICATION AND USAGE

**C.I. Basic Blue 48—57**

<b>C.I. Basic Blue</b>	<b>48</b>	<b>49</b>	<b>50</b>	<b>51</b>	<b>52</b>
<b>CHEMICAL CLASS</b>		Oxazine	Diphenylmethane	Monoazo	—
<b>C.I. CONSTITUTION NO.</b>		—	—	—	—
<b>SUBSTRATE</b>		ACRYLIC	ACRYLIC	ACRYLIC	PAPER
<b>HUE</b>		Bright Blue	Bright Blue	Reddish Navy	
Artificial Light (tungsten)		greener, duller	greener, duller	greener, duller	
<b>RESERVATION IN DYEBATH</b>					
cotton		3-4	4	3	
viscose		3-4	—	3	
wool		2	4-5	2	
nylon (type)		4 (6-6)	—	2	
polyester		5	—	3-4	
<b>FASTNESS</b>					
<b>TEST METHODS</b>					
<b>Light</b>	source	ISO	ISO	ISO	
	pale	day. Xe. arc	daylight	day. Xe. arc	
	medium	5 5	5	—	
	heavy	5-6 5-6	5-6	—	
		6 6	—	6 6-7	
<b>Perspiration</b>	acid/alk.	alkaline	alkaline	alkaline	
	change	4-5	5	4-5	
	staining	5	5	5	
<b>Pleating (steam)</b>	conditions	—	—	—	
	change	—	—	—	
	staining	—	—	—	
<b>Pressing (dry)</b>	conditions	180°C/30sec	150°C/15sec	180°C/30sec	
	change	4	4	3-4	
	after 2-4 hr	—	4-5	—	
	staining	4-5	—	5	
<b>Washing</b>	conditions	ISO 3	ISO 3	ISO 3	
	change	4-5	5	4-5	
	staining	5	5	5	
<b>NOTES ON APPLICATION AND USAGE</b>		Not dischargeable	Not dischargeable	Main usage is for light navy blue shades	<b>Paper</b> Main usage of this dye is on paper

53	54	55	56	57	C.I. Basic Blue
Azo	Monoazo	Triarylmethane	Triarylmethane	Monoazo	CHEMICAL CLASS
—	—	—	—	—	C.I. CONSTITUTION NO.
ACRYLIC	ACRYLIC		SILK	ACRYLIC	SUBSTRATE
Bright Reddish Blue	Bright Blue		Blue	Bright Blue	HUE
redder, brighter	redder		—	much redder	Artificial Light (tungsten)
5 5 4-5 2 (6-6) 3-4	5 5 5 3 (6-6) 4		— — — — —	4 3-4 3-4 3-4 4	RESERVATION IN DYE BATH cotton viscose wool nylon (type) polyester
ISO day. Xe.arc 6-7 6 7 6-7 7-8 6-7  alkaline 4-5 4-5  intermediate 4 4-5  — 4 4-5 —  ISO 3 4-5 5	ISO day. Xe.arc 6-7 6 7 6-7 7 6-7  alkaline 4-5 5  intermediate 4-5 4-5  — 4 4-5 —  ISO 3 4-5 5	Very similar in usage and properties to C.I. Basic Blue 26	C* daylight 1 1 2  — 2 —  — — —  4 — —  — 2 —	ISO day. Xe.arc 4-5 4 6 5-6 6 6  alkaline 5 5  intermediate 4 5  160°C/30sec 5 5 5  ISO 3 5 5	FASTNESS TEST METHODS  Light source pale medium heavy  Perspiration acid/alk. change staining  Pleating conditions (steam) change staining  Pressing conditions (dry) change after 2-4 hr staining  Washing conditions change staining
			Cotton Fastness C* light, 1, 1, 1 persp., 2-3 washing, 2  Bast fibres Acetate Nylon Paper—this is a major usage of this dye	Stable even under slightly alkaline conditions Stable up to 130°C  Modacrylics Fastness ISO daylight, 5-6, 6 persp., 4, 3-4 wash (3), 4-5, 5  Polyester (basic dyeable) Unsuitable	NOTES ON APPLICATION AND USAGE

**C.I. Basic Blue 58—67**

<b>C.I. Basic Blue</b>	<b>58</b>	<b>59</b>	<b>60</b>	<b>61</b>	<b>62</b>
<b>CHEMICAL CLASS</b>	Azo	Azo	Anthraquinone		Methine
<b>C.I. CONSTITUTION NO.</b>	—	—	—		—
<b>SUBSTRATE</b>	ACRYLIC	ACRYLIC	ACRYLIC		ACRYLIC
<b>HUE</b>	Reddish Blue	Reddish Blue	Blue		Reddish Blue
Artificial Light (tungsten)	much redder	duller	redder		redder
<b>RESERVATION IN DYE BATH</b>					
cotton	—	—	—		5
viscose	—	—	—		4
wool	—	—	—		3
nylon (type)	—	—	—		4
polyester	—	—	—		5
<b>FASTNESS</b>					
<b>TEST METHODS</b>	<b>AATCC</b> ( <i>Vonnel</i> )	<b>AATCC</b> ( <i>Vonnel</i> )	<b>AATCC</b> ( <i>Vonnel</i> )	This C.I. Generic Name is discontinued. Dyes formerly listed under it now appear under C.I. Basic Blue 45	<b>ISO</b>
<b>Light</b> source	Carbon arc	Carbon arc	Carbon arc		daylight
pale	5	5-6	6		6-7
medium	5-6	6	6		7
heavy	6	6-7	6-7		7-8
<b>Perspiration</b> acid/alk.	alkaline	alkaline	alkaline		alkaline
change	5	5	5		5
staining	5	5	5		5
<b>Pleating</b> conditions	severe	severe	severe		—
(steam) change	3	3	5		—
staining	—	—	—		—
<b>Pressing</b> conditions	180°C/15 sec	180°C/15 sec	180°C/15 sec		—
(dry) change	3-4	3-4	5		5
after 2-4 hr	—	—	—		5
staining	—	—	—		—
<b>Washing</b> conditions	III	III	III		ISO 3
change	5	5	5		5
staining	—	—	—		5
<b>NOTES ON APPLICATION AND USAGE</b>	Dischargeable	Dischargeable	Not dischargeable		



63	64	65	66	67	C.I. Basic Blue
Phthalocyanine	Monoazo	Azo	Azo	Azo	CHEMICAL CLASS
—	—	—	—	—	C.I. CONSTITUTION NO.
PAPER	ACRYLIC	ACRYLIC	ACRYLIC	ACRYLIC	SUBSTRATE
Blue greener	Greenish Navy little greener	Bright Blue little greener	Bright Blue little greener	Bright Blue little greener	HUE
					Artificial Light (tungsten)
— — — — —	— 2-3 2 — 3-4	— 5 5 — —	— 4-5 4 — —	— 4 4 — —	RESERVATION IN DYEBATH cotton viscose wool nylon (type) polyester
ISO daylight — 5 —  — — —  — — —  — — —  — — —	AATCC Carbon arc 4 6 6  alkaline 5 5  intermediate 4-5 —  160°C/15 sec 4-5 5 —  III 5 5	AATCC Carbon arc 6 7-8 7-8  alkaline 5 5  intermediate 4-5 —  160°C/15 sec 4 4 —  III 5 5	AATCC Carbon arc 6 7-8 7-8  alkaline 5 5  intermediate 4-5 —  160°C/15 sec 3-4 4 —  III 5 5	AATCC Carbon arc 6 7-8 7-8  alkaline 5 5  intermediate 5 —  160°C/15 sec 3 3-4 —  III 5 5	FASTNESS TEST METHODS  Light source pale medium heavy  Perspiration acid/alk. change staining  Pleating conditions (steam) change staining  Pressing conditions (dry) change after 2-4 hr staining  Washing conditions change staining
For all pulps. No fixing agent required Optimum pH 5 Fastness: 10% Na <sub>2</sub> CO <sub>3</sub> , 4 10% H <sub>2</sub> SO <sub>4</sub> , 3 Bleaching— oxidising, 5 reducing, 3	Stable pH 3.5-4.5 Rapid dyeing Not dischargeable  <b>Acetate</b> (print) Light fastness less than 3  <b>PVC fibres</b> Apply as complex with anionic surfactant Fastness AATCC light (C. arc), 4 persp., 5, 4-5 wash II, 5, 5	Stable pH 2-4.5 Moderate dyeing rate Readily discharge- able to white	Stable pH 2-4.5 Slow dyeing Good levelling Dischargeable  <b>Acetate</b> (print) Light fastness less than 3	Stable pH 2-4.5 Slow dyeing Recommended mainly for dark blues due to change of hue under heat treatment Dischargeable  <b>Acetate</b> (print) Fastness AATCC light (C. arc), 3-4 persp., 4-5, 4-5 wash II, 4-5, 5	NOTES ON APPLICATION AND USAGE

**C.I. Basic Blue 68—77**

<b>C.I. Basic Blue</b>	<b>68</b>	<b>69</b>	<b>70</b>	<b>71</b>	<b>72</b>
<b>CHEMICAL CLASS</b>	Azo	Methine	Monoazo	Monoazo	
<b>C.I. CONSTITUTION NO.</b>	—	—	—	—	
<b>SUBSTRATE</b>	ACRYLIC	ACRYLIC	ACRYLIC	ACRYLIC	
<b>HUE</b>	Bright Blue	Bright Blue	Dull Blue	Blue	
Artificial Light (tungsten)	greener	redder, duller	little redder	little redder	
<b>RESERVATION IN DYE BATH</b>					
cotton	—	—	4	4-5	
viscose	4	—	4	4	
wool	4	—	5	5	
nylon (type)	—	—	3-4	4	
polyester	—	—	5	5	
<b>FASTNESS</b>					
<b>TEST METHODS</b>	<b>AATCC</b>	<b>ISO</b>	<b>ISO</b>	<b>ISO</b>	
<b>Light</b> source	Carbon arc	—	day. Xe. arc	day. Xe. arc	This C.I. Generic Name is discontinued. Dyes formerly listed under it now appear under C.I. Basic Blue 22
pale	5-6	5	5-6 4-5	5-6 4-5	
medium	6-7	6	6 5	6 5	
heavy	6-7	6	6-7 5-6	6-7 5-6	
<b>Perspiration</b> acid/alk. change staining	alkaline 5 5	alkaline 5 5	alkaline 4-5 5	alkaline 5 5	
<b>Pleating (steam)</b> conditions change staining	intermediate 4-5 —	— —	intermediate 4 —	intermediate 5 —	
<b>Pressing (dry)</b> conditions change after 2-4 hr staining	160°C/15 sec 3 3-4 —	— — —	180°C/30 sec 4-5 — 5	180°C/30 sec 4-5 — 5	
<b>Washing</b> conditions change staining	III 5 5	ISO 1 5 5	ISO 3 4-5 5	ISO 3 5 5	
<b>NOTES ON APPLICATION AND USAGE</b>	Stable pH 3-4.5 Moderate dyeing rate Good levelling		Good levelling Dischargeable in pale and medium depths	Good levelling Dischargeable in pale and medium depths	

73	74	75	76	77	C.I. Basic Blue
Anthraquinone		Oxazine	Azo	Triarylmethane	CHEMICAL CLASS
—		—	—	—	C.I. CONSTITUTION NO.
ACRYLIC		ACRYLIC	ACRYLIC	ACRYLIC	SUBSTRATE
Blue		Bright Greenish Blue	Greenish Blue	Bright Blue	HUE
greener		greener	greener	redder	Artificial Light (tungsten)
2 2 2 2-3 2-3		3-4 3-4 3-4 3-4 —	2 1 2 2 5	4 3-4 2 3 4	RESERVATION IN DYEBATH cotton viscose wool nylon (type) polyester
ISO    AATCC	This C.I. Generic Name is discontinued. Dyes formerly listed under it now appear under C.I. Basic Blue 3	AATCC	AATCC	ISO    AATCC	FASTNESS TEST METHODS
day.    C. arc		—	Carbon arc	day.    C. arc	Light    source
4-5    2-3		6	6	5    6	pale
6    4-5		6-7	—	5-6    6	medium
6-7    5		6-7	6-7	6    6	heavy
alk.    —		—	alkaline	alk.    alk.	Perspiration    acid/alk.
5    —		5	5	5    5	change
5    —		—	5	4-5    4-5	staining
severe    —		—	—	inter.    severe	Pleating    conditions
5    —		—	—	5    4-5	(steam)    change
5    —		—	—	5    5	staining
140°C/15"		—	—	—    160°C/60"	Pressing    conditions
5    —		—	5	—    4	(dry)    change
5    —		—	5	—    —	after 2-4 hr
—    —		—	—	—    —	staining
ISO 1    III		III	III	ISO 3    III	Washing    conditions
5    5		4	5	5    4-5	change
5    5		5	5	5    5	staining
Good levelling Not dischargeable		Optimum pH 4.5-5.5 Not dischargeable  <b>Modacrylics</b> Suitable	Dischargeable  <b>Polyester</b> (basic dyeable) (Dacron 64) Fastness AATCC light (C. arc), 2-3 wash (IIIA), 5, 5  <b>Literature</b> USP 3132133	Stable pH 3-6.5 Moderate dyeing rate Dischargeable in pale depths  <b>Polyester</b> (basic dyeable) (Dacron 64) Fastness AATCC light (C. arc), 4 wash IIIA, 4-5, 5 Fastness ISO light (Xe. arc), 3-4 persp., 5, 5 wash (3), 5, 5	NOTES ON APPLICATION AND USAGE

**C.I. Basic Blue 78—87**

<b>C.I. Basic Blue</b>	<b>78</b>	<b>79</b>	<b>80</b>	<b>81</b>	<b>82</b>
<b>CHEMICAL CLASS</b>	Azo	Anthraquinone	Anthraquinone	Triarylmethane	Phthalocyanine
<b>C.I. CONSTITUTION NO.</b>	—	—	—	—	—
<b>SUBSTRATE</b>	ACRYLIC	ACRYLIC	ACRYLIC	—	PAPER
<b>HUE</b>	Bright Blue	Bright Blue	Blue	Greenish Blue	Bright Greenish Blue
Artificial Light (tungsten)	little change	little change	redder	—	—
<b>RESERVATION IN DYEBATH</b>					
cotton	4-5	4-5	—		
viscose	4-5	4	—		
wool	3-4	2-3	—		
nylon (type)	1-2 (6-6)	1-2 (6-6)	—		
polyester	3-4	3-4	—		
<b>FASTNESS</b>					
<b>TEST METHODS</b>	<b>ISO</b>	<b>ISO</b>	<b>ISO</b>		
<b>Light</b> source	day.      Xe.arc	day.      Xe.arc	—		
pale	6          6	5-6      5-6	7		
medium	7-8      7	6-7      6	7		
heavy	7-8      7	7          7	—		
<b>Perspiration</b> acid/alk.	alkaline	alkaline	—		
change	4-5	5	4-5		
staining	4-5	5	—		
<b>Pleating</b> conditions	intermediate	intermediate	—		
(steam)      change	4-5	4-5	—		
staining	4-5	4-5	—		
<b>Pressing</b> conditions	—	—	—		
(dry)      change	4	4	—		
after 2-4 hr	5	5	—		
staining	—	—	—		
<b>Washing</b> conditions	ISO 3	ISO 3	ISO 3		
change	4-5	4-5	4-5		
staining	4-5	4-5	5		
<b>NOTES ON APPLICATION AND USAGE</b>	<b>Acetate</b> By printing  <b>Triacetate</b> By printing  <b>Nylon</b> (basic dye-able) Suitable	<b>Acetate</b> By printing  <b>Triacetate</b> By printing  <b>Nylon</b> (basic dye-able) Suitable		<b>Printing Inks</b> Main usage of this dye  <i>See C.I. Solvent Blue 81</i>	<b>Paper</b> Fastness to 1% NaOH, fair 1% H <sub>2</sub> SO <sub>4</sub> , fair chlorine, poor light, good



83	84	85	86	87	C.I. Basic Blue
Triarylmethane	Azo	Azo	Monoazo	Oxazine	CHEMICAL CLASS
—	—	—	—	—	C.I. CONSTITUTION NO.
ACRYLIC	ACRYLIC	ACRYLIC	ACRYLIC	ACRYLIC	SUBSTRATE
Bright Reddish Blue	Reddish Blue	Bright Greenish Blue	Blue	Bright Greenish Blue	HUE
greener, duller	little greener	greener, duller	—	little greener	Artificial Light (tungsten)
—	—	—	—	4	RESERVATION IN DYEBATH
—	—	—	—	5	cotton
—	—	—	—	2	viscose
—	—	—	—	2	wool
—	—	—	—	5	nylon (type)
					polyester
AATCC (Vonnel) Carbon arc 5-6 6 6-7	AATCC (Vonnel) Carbon arc 5-6 6 6-7	AATCC (Vonnel) Carbon arc 4-5 5 5	ISO — — 6 —	AATCC (Orlon 42) Carbon arc 5-6 5-6 5-6	FASTNESS TEST METHODS
alkaline 5 5	alkaline 5 5	alkaline 5 5	— 4-5 —	alkaline 4 5	Light source pale medium heavy
severe 4-5 —	severe 4 —	severe 5 —	— — —	intermediate 4 5	Perspiration acid/alk. change staining
180°C/15 sec 4-5 — —	180°C/15 sec 4-5 — —	180°C/15 sec 5 — —	— — — —	160°C/60 sec 4 — 5	Pleating conditions (steam) change staining
III 5 —	III 5 —	III 5 —	ISO 1 5 —	III 3-4 5	Pressing conditions (dry) change after 2-4 hr staining
				Stable pH 2-6.5 Slow dyeing	Washing conditions change staining
				Modacrylics Fastness AATCC light (C.arc), 3-4 wash IIIA, 4-5, 5	NOTES ON APPLICATION AND USAGE
				Polyester (basic dyeable) (Dacron 64) Light fastness less than 3	

**C.I. Basic Blue 88—97**

<b>C.I. Basic Blue</b>	<b>88</b>	<b>89</b>	<b>90</b>	<b>91</b>	<b>92</b>
<b>CHEMICAL CLASS</b>	Triarylmethane	Triarylmethane	Azine	Monoazo	Thiazolazo
<b>C.I. CONSTITUTION NO.</b>	—	—	—	—	—
<b>SUBSTRATE</b>	ACRYLIC	ACRYLIC	ACRYLIC	ACRYLIC	ACRYLIC
<b>HUE</b>	Greenish Blue	Bright Blue	Blue	Navy	Reddish Blue
Artificial Light (tungsten)	greener, brighter	duller	greener, duller	greener	redder
<b>RESERVATION IN DYEBATH</b>					
cotton	5	—	3	2-3	—
viscose	5	2-3	2	2	—
wool	5	1-2	3	1-2	—
nylon (type)	—	—	4 (6-6)	2	—
polyester	—	—	5	4-5	—
<b>FASTNESS</b>					
<b>TEST METHODS</b>	<b>AATCC</b>	<b>AATCC</b>	<b>AATCC</b>	<b>AATCC</b>	<b>AATCC</b>
<b>Light</b> source	Carbon arc	Carbon arc	Carbon arc	Carbon arc	Carbon arc
pale	4-5	4-5	4-5	6	5
medium	5	5-6	5-6	6-7	6
heavy	5	6	—	8	6
<b>Perspiration</b> acid/alk.	alkaline	alkaline	alkaline	alkaline	alkaline
change	5	5	5	4-5	5
staining	5	5	—	5	4-5
<b>Pleating</b> conditions	intermediate	intermediate	intermediate	—	—
(steam) change	4-5	5	4	4-5	—
staining	—	—	—	4	—
<b>Pressing</b> conditions	160°C/15 sec	160 C/15 sec	—	—	150°C/5 min
(dry) change	4-5	4-5	—	—	4-5
after 2-4 hr	4-5	5	—	—	—
staining	—	—	—	—	—
<b>Washing</b> conditions	III	III	III	—	III
change	5	5	5	5	5
staining	5	5	—	5	5
<b>NOTES ON APPLICATION AND USAGE</b>	Stable pH 2-4.5 Slow dyeing Good levelling Suitable for coloured discharges with stannous salts Dischargeable in pale depths with C.I. Reducing Agent 1  <b>Acetate</b> (print) Light fastness less than 3	Stable pH 2-6 Rapid dyeing Good discharge-ability  <b>Acetate</b> (print) Fastness AATCC light (C. arc), 3-4 persp., 4, 4-5 wash II, 3, 5	Stable pH 3-7  <b>Polyester</b> (basic dyeable) Suitable		

93	94	95	96	97	C.I. Basic Blue
Azo	Anthraquinone	Oxazine	Oxazine	Anthraquinone	CHEMICAL CLASS
—	—	—	—	—	C.I. CONSTITUTION NO.
ACRYLIC	NYLON (basic dyeable)	ACRYLIC	ACRYLIC	NYLON (basic dyeable)	SUBSTRATE
Navy	Blue	Blue	Greenish Blue	Greenish Blue	HUE
redder	little change	redder	greener		Artificial Light (tungsten)
— — — —	— — 5 —	— — — —	— — — —	3-4 3-4 — 5 —	RESERVATION IN DYEBATH cotton viscose wool nylon (type) polyester
AATCC Carbon arc — 6-7 7  alkaline 5 5  — — —  — — —  III 5 5	AATCC Carbon arc 4 4-5 —  — — —  — — —  — — —	ISO day. Xe. arc 4 4 5 5 6 6  alkaline 5 5  — — —  — 5 —  ISO 3 5 5	ISO day. Xe. arc 4 4 4-5 4-5 5-6 5-6  alkaline 5 5  — — —  — 5 —  ISO 3 5 5	AATCC Carbon arc 5-6 5 4-5  — — —  — — —  160°/15 min 5 — —  — — —	FASTNESS TEST METHODS  Light source pale medium heavy  Perspiration acid/alk. change staining  Pleating conditions (steam) change staining  Pressing conditions (dry) change after 2-4 hr staining  Washing conditions change staining
	Stable pH 5-8 Of particular interest for dyeing carpets			Stable pH 5-8 Of particular interest for dyeing carpets	NOTES ON APPLICATION AND USAGE

# C.I. Basic Blue 98

C.I. Basic Blue	98	
<b>CHEMICAL CLASS</b>	Disazo	
<b>C.I. CONSTITUTION NO.</b>	—	
<b>SUBSTRATE</b>	ACRYLIC	
<b>HUE</b>	Blue	
Artificial Light (tungsten)	little brighter	
<b>RESERVATION IN DYEBATH</b>		
cotton	1	
viscose	1	
wool	1	
nylon (type)	1	
polyester	1-2	
<b>FASTNESS</b>		
TEST METHODS	AATCC	
Light	source	Carbon arc
	pale	7
	medium	7-8
	heavy	7-8
Perspiration	acid/alk.	alkaline
	change	5
	staining	5
Pleating (steam)	conditions	intermediate
	change	4-5
	staining	4
Pressing (dry)	conditions	—
	change	—
	after 2-4 hr	—
	staining	—
Washing	conditions	II
	change	5
	staining	5
<b>NOTES ON APPLICATION AND USAGE</b>		



# C.I. Basic Green 1—3

C.I. Basic Green	1		2	3
CHEMICAL CLASS	Triarylmethane		—	Triarylmethane
C.I. CONSTITUTION NO.	42040		—	—
SUBSTRATE	SILK	ACRYLIC	WOOL	ACRYLIC
HUE	Bright Green	Bright Green	Bright Bluish Green	Bright Bluish Green
Artificial Light (tungsten)	little yellower	little yellower	—	yellower
RESERVATION IN DYEBATH				
cotton	2	2	—	4
viscose	2	2	—	5
wool	2	2	—	3-4
nylon (type)	4	4	—	4-5
polyester	—	—	—	5
FASTNESS				
TEST METHODS	ISO	ISO AATCC	C* A*	AATCC
Light source	daylight	Xe. arc C. arc	daylight	Carbon arc
pale	2	— 3	1	4-5
medium	2	4 2-3	1	4-5
heavy	3	—	2	4-5
Perspiration acid/alk. change staining	alkaline 4-5 1	alk. 4 4-5	— — —	alkaline 4-5 5
Pleating (steam) conditions change staining	— — —	inter. 5 4	— — —	intermediate 4 5
Pressing (dry) conditions change after 2-4 hr staining	— 5 — —	— — — —	— — — —	160°C/15 sec 5 5 5
Washing conditions change staining	ISO 1 2 4	ISO 3 4 4-5	— 3 5	III 5 5
NOTES ON APPLICATION AND USAGE	<p><b>Cotton</b> (tannin mordant), Fastness C* light, 1, 1, 2; washing, 4-5, 2</p> <p><b>Wool</b> Fastness: light A*, 1, 1, 2; washing C*, 2-3, 5 Withstands chrome</p> <p><b>Bast fibres, Acetate, Nylon, PVC fibres</b> <b>Paper</b></p> <p><b>Pigments</b>—with high mol. wt. acids; see C.I. Pigment Greens 1, 2 &amp; 3</p> <p><b>Leather</b>—on semichrome and veg. tannages; tends to bronze and to mark off</p> <p><b>Spirit Inks, Wood Stains</b> <b>Indicator</b> <b>Biological Stain, Medicinal</b> <b>Solvent Dye</b>—base is used Soluble in alcoholic media, oils, fats and waxes</p>		<p>Dyeings withstand chrome</p> <p><b>Cotton</b> (tannin mordant) Fastness C*: light, 1, 1, 2 washing, 4, 4-5 For direct dyeing, printing and dyeing on discharged tannin mordant</p> <p><b>Silk</b> <b>Leather</b> <b>Paper</b></p>	<p>Stable pH 2-5 Slow dyeing</p> <p><b>Modacrylics</b> Fastness (AATCC) light (C. arc), 2-3</p> <p><b>Polyester</b> (basic dyeable) Suitable for printing</p>

# C.I. Basic Green 4—10

C.I. Basic Green	4				5	6		
CHEMICAL CLASS	Triarylmethane				Thiazine	Quinoline		
C.I. CONSTITUTION NO.	42000				52020	—		
SUBSTRATE	COTTON (tannin mordant)		ACRYLIC		COTTON (tannin mordant)	ACRYLIC		
HUE	Bright Bluish Green		Bright Bluish Green		Dull Bluish Green	Dull Green		
Artificial Light (tungsten)	little yellower		little yellower		little yellower	yellower		
RESERVATION IN DYEBATH								
cotton	—		5		—	4		
viscose	—		5		—	3		
wool	—		5		—	3		
nylon (type)	—		5 (6·6)		—	3		
polyester	—		5		—	3		
FASTNESS								
TEST METHODS	C*	A*	ISO	AATCC	B*	A*	ISO	
Light	source	day.	day.	day.	C. arc	day.	day.	daylight
	pale	1	—	2-3	2-3	1	—	7
	medium	1	1-2	3	2-3	2	5	7-8
	heavy	2	—	4	—	2-3	—	8
Perspiration	acid/alk.	—	—	alk.	—	—	—	alkaline
	change	—	4-5	4-5	—	2	4	5
	staining	—	—	4-5	—	—	—	5
Pleating (steam)	conditions	—	—	inter.	inter.	—	—	intermediate
	change	—	—	4-5	4-5	—	—	4-5
	staining	—	—	4	—	—	—	—
Pressing (dry)	conditions	—	—	—	—	—	—	—
	change	—	3	4	—	—	3	5
	after 2-4 hr	—	—	4-5	—	—	—	5
	staining	—	—	5	—	—	—	—
Washing	conditions	—	—	ISO 3	—	—	—	ISO 3
	change	4	3-4	4-5	—	2	3	5
	staining	4-5	—	4-5	—	—	—	5
NOTES ON APPLICATION AND USAGE	Acrylic—extensively used as basis of blacks Silk Fastness C* light, 1-2; washing, 3 Wool Fastness C*: light, 1, 1, 2; washing, 2, 5 Bast fibres Acetate (print) Fastness (AATCC): light (C. arc), 3-4; persp., 2-3, 4; washing II, 1, 5 Pigments—with high mol. wt. acids; see C.I. Pigment Green 4 Paper Leather—tends to bronze Cellulose nitrate lacquers Spirit inks, Oils, Waxes Solvent Dye—the base is C.I. Solvent Green 1				Silk Fastness C* light, 2; washing, 4 Acrylic—hue bright green Fastness (AATCC) light (C. arc), 4 persp., 5 washing III, 5 Paper Leather—on veg. tannages Biological Stain		Dischargeable with sodium sulphocyanide and C.I. Reducing Agent 4 Silk (print) Fastness (ISO) daylight, 1, 2, 2 persp., 4, 3-4 washing (1), 4, 4	

7	8	9	10	C.I. Basic Green
Azo	Polyazamethine	Triarylmethane	Triarylmethane	CHEMICAL CLASS
—	—	—	—	C.I. CONSTITUTION NO.
ACRYLIC	ACRYLIC	ACRYLIC	ACRYLIC	SUBSTRATE
Green	Bluish Green	Yellowish Green	Bluish Green	HUE
—	yellower	yellower	yellower	Artificial Light (tungsten)
— — — — —	4 3 4 3 4	— — — — —	— — — — —	RESERVATION IN DYEBATH cotton viscose wool nylon (type) polyester
AATCC Carbon arc 6 5 —  alkaline 4-5 5  — — —  — — —  III 5 5	ISO day. Xe. arc 6 6 6-7 6-7 7 6-7  alkaline 5 5  intermediate 4 —  — — —  ISO 3 4-5 5	AATCC (Vonnell) Carbon arc 5-6 6 6-7  alkaline 5 5  severe 5 5  180°C/15 sec 5 — —  III 5 —	ISO daylight 6-7 6-7 6-7  alkaline 5 5  — — —  — 3-4 5 —  ISO 3 4-5 5	FASTNESS TEST METHODS  Light source pale medium heavy  Perspiration acid/alk. change staining  Pleating conditions (steam) change staining  Pressing conditions (dry) change after 2-4 hr staining  Washing conditions change staining
	Moderately good dischargeability in pale shades Good levelling			NOTES ON APPLICATION AND USAGE

NOTES



# C.I. Basic Brown 1—5

C.I. Basic Brown	1	2	3	4	5
<b>CHEMICAL CLASS</b>	Disazo	Disazo		Disazo	Disazo
<b>C.I. CONSTITUTION NO.</b>	21000	21030		21010	Similar to 21010
<b>SUBSTRATE</b>	COTTON (tannin mordant)	ACRYLIC		SILK	
<b>HUE</b>	Brown	Reddish Brown		Reddish Brown	
Artificial Light (tungsten)	little redder	stronger		much greener	
<b>RESERVATION IN DYE BATH</b>					
cotton	—	2		2	
viscose	—	2-3		1	
wool	—	2-3		2	
nylon (type)	—	1		2	
polyester	—	4		—	
<b>FASTNESS</b>					
<b>TEST METHODS</b>	C*	A*	AATCC	ISO	
Light	source	day.	Carbon arc	daylight	
	pale	1	—	1	
	medium	1-2	3	1	
	heavy	2	6-7	2	
Perspiration	acid/alk.	—	alkaline	alkaline	Very similar in
	change	—	1	4	usage and
	staining	—	—	2	properties to C.I.
Pleating	conditions	—	—	—	Basic Brown 4
(steam)	change	—	—	—	
	staining	—	—	—	
Pressing	conditions	—	—	—	
(dry)	change	—	—	—	
	after 2-4 hr	4	—	—	
	staining	—	—	—	
Washing	conditions	—	III	ISO 1	
	change	1	2-3	1	
	staining	1	—	2	
<b>NOTES ON APPLICATION AND USAGE</b>	Direct dyeing, printing, dyeing on discharged tannin mordant  Silk Fastness (C*) light, 1, 1-2, 2 washing, 1-2, 2  Wool Fastness (C*) light, 1, 1-2, 2 washing, 1-2 Bast fibres Paper Pigments Distempers Leather Wood Stain Biological Stain Solvent Dye The base is used for oils, fats and waxes	Leather Shoe Polishes Suede dressing	This C.I. Generic Name is discontinued	Cotton (tannin mordant) Fastness (C*) light, 1, 1, 2 perspiration, 1 washing, 1, 2  Wool Fastness (C*) light, 1 washing, 2  Bast fibres Acrylic fibres Pigments—with high mol. wt. acids; see C.I. Pigment Brown 3 Paper Leather Wood Stain Biological Stain Solvent Dye Base is C.I. Solvent Brown 12	

# C.I. Basic Brown 6—15

C.I. Basic Brown	6	7	8	9,10	11
CHEMICAL CLASS	—	Disazo	—		
C.I. CONSTITUTION NO.	—	—	—		
SUBSTRATE	SILK	COTTON (tannin mordant)	COTTON (tannin mordant)		
HUE	Reddish Brown	Reddish Brown	Dull Reddish Brown		
Artificial Light (tungsten)	—	little yellower	—		
RESERVATION IN DYE BATH cotton viscose wool nylon (type) polyester					
FASTNESS TEST METHODS	C*	C*	C*	These C.I. Generic Names are discontinued	This C.I. Generic Name is discontinued. Dyes formerly listed under it now appear under C.I. Basic Orange 30
Light source	daylight	daylight	daylight		
pale	—	1	—		
medium	2-3	1	1-2		
heavy	—	2	—		
Perspiration acid/alk.	—	—	—		
change	1-2	—	—		
staining	—	—	—		
Pleating conditions	—	—	—		
(steam) change	—	—	—		
staining	—	—	—		
Pressing conditions	—	—	—		
(dry) change	—	—	—		
after 2-4 hr	—	—	—		
staining	—	—	—		
Washing conditions	—	—	—		
change	1-2	1	2-3		
staining	—	1-2	—		
NOTES ON APPLICATION AND USAGE	Not dischargeable  Cotton (tannin mordant) Fastness (C*) light, 3-4 washing, 2	Acrylic fibres Paper Leather Wood Stains (aqueous)	Leather		

12	13	14	15	C.I. Basic Brown
Azo	Azo	Monoazo	Monoazo	CHEMICAL CLASS
—	—	—	—	C.I. CONSTITUTION NO.
ACRYLIC	ACRYLIC	ACRYLIC	ACRYLIC	SUBSTRATE
Reddish Brown	Dull Reddish Orange	Dull Reddish Orange	Reddish Brown	HUE
—	redder	redder, brighter	little change	Artificial Light (tungsten)
— — — — —	2-3 3-4 3 3-4 3-4	— — — — —	2 2 1 1 1-2	RESERVATION IN DYEBATH cotton viscose wool nylon (type) polyester
AATCC Carbon arc 4-5 5-6 6 alkaline 4-5 5 — — — 160°C/15 sec 4 4-5 — III 5 5	ISO daylight 6-7 7 7 alkaline 5 5 severe 5 5 140°C/15 sec 4 5 — ISO 1 5 5	AATCC Carbon arc 6 6-7 6-7 — — — alkaline 4-5 5 — — — — — III 5 5	ISO daylight 6 7 7 alkaline 5 4-5 intermediate 5 5 — — — — ISO 3 4-5 5	FASTNESS TEST METHODS Light source pale medium heavy Perspiration acid/alk. change staining Pleating conditions (steam) change staining Pressing conditions (dry) change after 2-4 hr staining Washing conditions change staining
Recommended pH 3-4			Dischargeable	NOTES ON APPLICATION AND USAGE





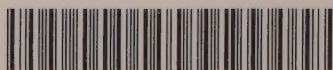
# C.I. Basic Black 1—4

C.I. Basic Black	1	2	3	4
<b>CHEMICAL CLASS</b>	Azine	Monoazo	Monoazo	—
<b>C.I. CONSTITUTION NO.</b>	50431	11825	11825 (similar to)	—
<b>SUBSTRATE</b>	COTTON	ACRYLIC	COTTON (tannin mordant)	COTTON (tannin mordant)
<b>HUE</b>	Grey	Bluish Grey to Black	Greenish Black	Reddish Black
Artificial Light (tungsten)	—	yellower	greener	—
<b>RESERVATION IN DYE BATH</b>				
cotton	—	2	—	—
viscose	—	3	—	—
wool	—	2	—	—
nylon (type)	—	—	—	—
polyester	—	2	—	—
<b>FASTNESS</b>				
TEST METHODS	C*	AATCC	A*	C*
Light	source	Carbon arc	daylight	daylight
pale	—	3-4	—	—
medium	1	6	—	—
heavy	—	7	1	2-3
Perspiration	acid/alk.	alkaline	—	—
change	—	5	3	—
staining	—	5	—	—
Pleating	conditions	intermediate	—	—
(steam)	change	4-5	—	—
staining	—	—	—	—
Pressing	conditions	160°C/15 sec	—	—
(dry)	change	3-4	3-4	—
after 2-4 hr	—	4	—	—
staining	—	—	—	—
Washing	conditions	III	—	—
change	1-2	5	2	—
staining	—	5	—	—
<b>NOTES ON APPLICATION AND USAGE</b>	<p>Limited usage on cellulosic fibres with tannin-antimony or synthetic mordant or from acetic acid bath in absence of a mordant</p> <p>Print on tannin or chromium acetate mordant</p> <p>Suitable for illuminated discharges</p> <p><b>Silk</b> Fastness (C*) light, 1; washing, 4</p> <p><b>Leather</b>—poor fastness to light</p>	<p>Stable pH 3-6</p> <p>Rapid dyeing. Shade of dyeing can vary slightly with change in pH of dye bath</p> <p><b>Cotton</b>—on tannin-antimony mordant gives greenish blacks</p> <p><b>Wool/Cotton</b> blends dyed from acid bath without the cotton being mordanted</p>	<p><b>Silk</b> Fastness (A*) light, 2-3 perspiration, 3 hot pressing, 3 washing, 2-3</p> <p><b>Leather</b> <b>Shoe Polishes</b> <b>Suede Dressings</b> <b>Biological Stain</b></p>	<p><b>Wool</b> Fastness (C*) light, 1-2</p> <p><b>Bast fibres</b> <b>Paper</b> <b>Leather</b></p>

**C.I. Basic Black 5—8**

<b>C.I. Basic Black</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>
<b>CHEMICAL CLASS</b>	—		Oxazine	Azo
<b>C.I. CONSTITUTION NO.</b>	—		51215	—
<b>SUBSTRATE</b>	COTTON (tannin mordant)		COTTON (tannin mordant)	ACRYLIC
<b>HUE</b>	Reddish Black		Blue-Black	Black
Artificial Light (tungsten)	—		—	—
<b>RESERVATION IN DYE BATH</b> cotton viscose wool nylon (type) polyester				
<b>FASTNESS</b> TEST METHODS	C*	This C.I. Generic Name is discontinued		AATCC (Vonnel) Carbon arc
Light	daylight			—
source	—			4-5
pale	—			6
medium	2-3			alkaline
heavy	—			5
Perspiration	—			5
acid/alk.	—			severe
change	—			5
staining	—			—
Pleating (steam)	—			180°C/15 sec
conditions	—			5
change	—			—
after 2-4 hr	—			—
staining	—			III
Pressing (dry)	—			5
conditions	—			—
change	—			
after 2-4 hr	—			
staining	—			
Washing	—			
conditions	—			
change	—			
staining	—			
<b>NOTES ON APPLICATION AND USAGE</b>	Wool Fastness (C*) light, 1-2 Bast fibres Paper Leather		Gives deep black on sumach-iron mordant  Leather—on vegetable or synthetic tannages Gives blacks of com- paratively good fastness to light	Not dischargeable





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1 PIECE



